RURAL ECONOMY

Social, Economic and Psychological Factors in Decisions of Alberta Farmers

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Project Report No. 92-10

Farming for the Future Project #880406

PROJECT REPORT

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SOCIAL, ECONOMIC AND PSYCHOLOGICAL FACTORS IN DECISIONS OF ALBERTA FARMERS

1 INTRODUCTION

1.1 The Problem

A central role of the farm operator, and one that determines the ability of the operator to cope with uncertainty, is the making of decisions. The situations which necessitate decisions on the farm are complicated by the dual nature of the farm household which encompasses two separate, yet inextricably linked, entities: the farm firm and the farm family. Farm decision makers must consider the multitude of complex factors which have an impact on both of these entities. In addition, the decision makers must also contemplate the needs of both the farm firm and the farm family, which are often in competition with each other for scarce resources.

The role of a farm decision maker is especially important in conditions of instability such as are currently being experienced by farmers in Alberta as a result of markets, prices, changing government policy for agriculture and the economic climate in Alberta in general. The farm operator, faced with making important financial decisions in a time of economic instability, is more likely to experience financial stress than he/she would in a more stable time.

Literature published by government and university research groups often addresses the farm manager, or 'business farmer', who views the farm as a business enterprise and makes decisions according to strict business principles. The opposite stereotype, that of a 'life-style farmer' who enjoys farming as an occupation and a way of life, is hardly addressed. In reality, these stereotypes do not exist. Business-oriented farm operators are not solely influenced in their farm decisions by economic factors. Neither is the social farmer motivated by seemingly non-economic criteria alone. Instead, there are many factors which simultaneously influence farm operators, and this combination of factors affects the outcome of the decision-making process. This study aims to discover these factors of diverse nature.

1.2 Study Purpose

The purpose of this study is to analyze the impact of economic, social and psychological factors on the decision-making process of farm operators. Specifically, the study considers the decision-making process and examines the relationship that exists between the extent of 'managerial considerations' exhibited in the decision-making process and the 'personal orientations' of farm operators. The specific objectives of this study are to establish the relationship between a farm operator's personal and farm characteristics and his/her personal orientation and further to establish the relationship between personal orientation and the extent to which managerial considerations influence the process of making decisions.

1.3 Conceptual Framework

Personal orientation refers to the combination of individual's goals and values. It is derived from the individual's unique personal characteristics and determines the manner in which he/she views the world. Personal orientation was measured by assigning both a business and a social orientation score to each respondent based on responses to a series of goal statements. The goal statements were categorized as being predominantly business or social in orientation. Four possible personal orientation combinations were established. The first possible combination was that the respondent scored high on the business orientation scale and high on the social orientation scale. The second possible orientation combination was that the respondent scored high on the business orientation scale and low on the social orientation

scale. The third possible orientation combination was that the respondent scored low on the business orientation scale and high on the social orientation scale. The final combination occurred when the respondent scored low on both business and social orientation scales.

The specific personal and farm firm characteristics which were considered to be related to personal orientation were the stage of the family life cycle, age, education, organizational involvement, history of farming, income, farm size, amount of off-farm employment and risk-tolerance. It was hypothesized that those respondents with a high level of business and social orientation would be at an earlier stage of the family life cycle, would be younger, have more education, less community organizational involvement, more industry organizational involvement, shorter history of farming, higher income, larger farm, larger amount of off-farm employment, greater risk tolerance, and would be more likely to have inherited their farms.

The decision-making process was studied by evaluating the amount and type of managerial considerations that the respondents exhibited at various stages in the process of making decisions. The score for managerial considerations was derived from a series of questions on the application of basic economic principles, record keeping and information searching behaviors. It was expected that those farm operators with a high score on both business and social orientations would rank higher on the scale of managerial considerations in the decision-making process than those farmers who have other combinations of personal orientation.

1.4 Study Process

In order to fulfil the objectives, the study was accomplished in four stages. The first stage consisted of consultation with staff from Alberta Agriculture and researchers from the University of Alberta. The second stage involved an in-depth analysis of the relevant literature. The third stage consisted of personal interviews with selected farm operators from Alberta Agriculture's Northwest Region which were completed in August 1988. The fourth stage was the field study which involved collection of quantitative data using a mailed questionnaire from 400 farm operators. The purpose of the field study was to derive the quantitative data with which to empirically test the hypotheses.

An assumption was made that decision-making behavior varies with personal orientation. It was assumed that respondents with different personal orientations would exhibit differing amounts of managerial considerations in their decision-making process. Decision-making behavior was also assumed to be observable and amenable to measurement by the survey instrument.

This study was conducted in Alberta Agriculture's Northwest Region. As such, this study cannot be said to reflect the opinions, attitudes, and behaviors of all farm operators in Alberta.

1.5 Potential Uses of This Study

This study has the potential to benefit both agricultural extension workers and farm operators by distinguishing the key social, psychological and economic factors which influence the farm decision-making process. The identification of the appropriate factors which influence decision-makers and a knowledge of the degree to which they influence management decisions will assist Alberta Agriculture in the design and delivery of its extension programs. With this knowledge the extension programs can be tailored to assist farm-operators in making effective decisions. During a period of economic instability, such as is currently being experienced by many farm operators, it is very important that farm managers evaluate properly all the major factors involved in the farm decisions. Also, given the likelihood that this instability may continue for some time, effective decision-making will continue to be a critical element of farm management.

Many farm operators are keenly interested in improving the efficiency of their operation. The clarification of relationships between value orientation, personal characteristics and managerial considerations during the decision-making process will assist these farm operators by illustrating the importance of their values and long range goals in their decisions.

2 RELATED LITERATURE

The observance of decision-making behavior provides an understanding of how people act when faced with a problem situation. If this observed information is to be of any value, there must be additional understanding of why people act in the manner they do. The study of farm operator decision-making behavior requires a theoretical comprehension of the basis of human action and motivation. Similarly, insight into goals of farm operators cannot be attained without a prior understanding of basic human values. Once the theoretical basis of knowledge about human action and values has been established, their relation to the decision-making process, and more specifically to the farm management decision-making process, can then be determined.

2.1 Human Action

Decision-making has foundations in action and motivation theories. Action occurs upon completion of the decision-making process. According to Parsons et al. (1962), the theory of action is based on the study of the structure of an individual's orientation to a given situation. There are two dimensions to an individual's orientation to a situation: motivational orientation and value orientation.

The theory assumes that all behavior is directed by plans, that those plans are hierarchically arranged, and that the feedback from the environment articulates with plans in the guidance of action. In decision-making theory, these plans are referred to as goals which are influenced by needs. Maslow's (1987) theory of motivation is based on a hierarchy of needs which motivate all human behavior. As the level of satisfaction of basic human needs increases, the individual moves up the hierarchy. The needs higher up in the hierarchy normally do not emerge, as strong motivators, until the lower level needs are reasonably satisfied.

2.2 Values and Goals

The concept of value forms a part of the theoretical foundation of a number of academic disciplines such as mathematics, economics, sociology, psychology and political science. The definition of value adopted in any given situation depends entirely upon the context in which it is being used. Rokeach (1973) defines a value "as a long held belief that a specific mode of conduct or state of existence is personally or socially preferable to an opposite or converse mode of conduct or state of existence." Values are not only held by the individual, but also by society. To a social researcher, societal values are easier to measure because they are embodied in the language, norms, laws and institutions of the society. Personal values are more difficult to identify as they are an integral part of the individual and, although they influence every action, are not necessarily conscious even to the individual. Values are ideas and can be inferred from choices people make among courses of action.

Goals are the more concrete end states of values. Goals are frequently equated with objectives and ends. Gasson (1973) differentiates goals from values in that values are more of a permanent characteristic of the individual. Values give rise to the ranking of the importance of goals. They define the approved and disapproved means of attaining goals. Both goals and values are hierarchical in nature. Some goals and values are ends in themselves, while others are only means to achieve other higher order goals and values.

2.3 Value Orientations

Individuals do not have just a single value which governs their behavior, rather they have many values which are part of an all encompassing value orientation. A value orientation may be defined as "a generalized and organized conception, influencing behavior, of nature, of man's place in it, of man's relation to man and of the desirable and non-desirable as they may relate to man-environment and inter-human relations" (Kluckhohn, 1962:411). Parsons et al. (1962) observed that whenever an individual must make a decision, "... his value orientations may commit him to certain norms that will guide him in his choices." All human behavior is governed by value orientations.

2.4 Decision Making Process

The purpose of every action is to achieve some goal. Decisions to act are made by individuals on the basis of how they perceive their environment themselves, their goals, resources and possible outcomes. Decision making is a dynamic process. The end of one cycle of the decision process is the achievement or non-achievement of a goal. The generalized steps in the decision-making process include the recognition of a problem, goal-setting, analysis of alternative courses of action, action, and evaluation. The decision process, in its entirety, is bounded by the decision frame of the individual decision maker. The decision frame is:

> ... the decision-maker's conception of the acts, outcomes, and contingencies associated with a particular choice. The frame that a decision-maker adopts is controlled partly by the formulation of the problem and partly by the norms, habits, and personal characteristics of the decision maker (Bokelmann, 1986).

The decision frame constitutes the decision environment. The decision environment affects the degree of conscious decision-making and is itself affected by a person's perceptions and value system. In a farm situation, for example, it is the way in which a farmer perceives the world which is more important, than what is actually there on the farm.

2.5 Concepts Relevant to Family Farm Management

2.5.1 Family Farming

The interaction between the farm family and the farm business makes the family farm unique from any other business. The interdependence of the two arises because they share a common stock of limited resources (Heady et al., 1953). The combination of farm family and family interests competing for scarce resources is complicated due to the presence of the family members. Every family member has an interest in decisions which affect both farm and family. The allocation of resources, on the farm, is further complicated by the fact that each of the decision makers possesses their own set of goals and objectives which they want satisfied. Because of the sharing of resources, there frequently arise situations in which the objectives of the farm, in terms of production or investment, conflict with the household, in terms of consumption (Gasson et al., 1988; Moran, 1988). As a result, compromises need to be made between farm investment and household consumption. Research by Harrison (1975) shows that family needs are often given less importance than the farm firm's requirements.

Concern about the maintenance of the farm for future generations affects many farm management decisions. In a study of the effect of farm interests on the management of the farm, Carlson and Dillman (1983) noted that when two generations farm together, they are more careful about maintaining the soil resources to ensure the long term future of the farm.

2.5.2 Family Life Cycle

The financial needs of the farming operation often reflect the cycle of the farm family (Heady et al., 1953). Barlett (1977) identified a relationship between the choice of risky, labor intensive crops and the stage of the family life cycle. Barlett's data indicated that profit consideration was not the sole factor in influencing the decision-making process, but rather factors such as the degree of drudgery involved were important in the consideration of crop rotations. The stage of the family life cycle thus was a major factor in deciding whether a crop involving heavy physical work should be planted.

An example of the parallel nature of the family cycle and financial behavior is the attitude toward risk. Younger farmers are more likely to feel comfortable with riskier investments than older farmers. Older farmers tend to be more concerned with maintaining a comfortable living for the rest of their lives and are less likely to feel comfortable risking their future because they have less time to rebuild if they lose out on an investment (Barlett, 1977).

Although values may stay relatively unchanged for the farm family throughout the family life cycle, the concrete goals and objectives may change to reflect the changing needs and interests at different stages of the farm family cycle. A study by Harman et al. (1972) found that a goal of increasing net worth increases with education, farm experience and farm size, but decreases with age.

2.5.3 Farm Goals and Values

As discussed earlier, personal values and goals provide the impetus for all human behavior. Values are ideas of the desirable held by individuals, groups, and society (Gasson, 1973). Values are organized into a system of value orientations which determines goals. Much of the research in the area of individual values has inferred value orientation from measurement of goals. This is done because values are so central to an individual's makeup that they are more difficult to quantify or measure. Goals, being the more concrete end states of behavior that are desired, are easier to observe.

Values that have traditionally been attributed to rural North Americans are related to quality of life factors such as a good environment in which to raise children, clean water and air, little crime and friendly nature of community life (Christensen, 1979). From his research on rural Americans, Larson (1978) noted that although there are observable differences in values between rural and urban people, these differences are not as great as some people have hypothesized. In addition, Larson states that although rural values may be different in certain ways from urban values, there is not a single overwhelmingly rural value.

Gasson (1973) identified the central values in farming as being *instrumental*, influenced by the desire for financial gain; *social*, related to family or community recognition; *expressive*, achieving a sense of personal growth and achievement; and *intrinsic*, desiring independence and enjoyment of occupation. The most commonly cited value of farm managers was related to intrinsic qualities, such as feelings of independence and personal satisfaction. Instrumental qualities, including financial desires, were less frequently reported as important values.

The existence of multiple goals that compete, complement, or act independently between the family farm household and the farm business, between individuals, and even within the individual must be recognized (Patrick and Eisgruber, 1968). Farmers try to achieve many goals simultaneously, and to force all their decisions into the profit motive means ignoring other considerations (Barlett, 1977).

2.5.4 Risk and Uncertainty in Farming

The uncertainty inherent in farming arises because of a number of variables which are beyond the control of the individual farm operator. Hirshleifer and Riley (1979) identify two sources of uncertainty with which the decision maker is faced. Market uncertainty arises when the decision maker is unsure about

the market behavior of other economic agents. Olsson (1988) argues that farmers are continually faced with an increasing amount of uncertainty largely as a result of the integration of the local agricultural economy with the world economy.

Event uncertainty occurs when the decision maker is uncertain about events that may occur outside of the market. Examples of event uncertainty in agriculture are changeable weather patterns, the finite nature of resource availability, and changes in public policy that may affect prices, taxes and farm income (Hirschleifer and Riley, 1979).

Attitudes towards risk are influenced by a number of personal factors, including personality, characteristics. Rogers and Shoemaker (1971) found that early adopters of innovations tend to have a more favorable attitude towards risk. These are the farm operators who are more willing to try the new innovation because of its apparent benefits. Recent research by Hazell (1982) indicates that most farmers tend to behave in ways so as to avoid risk.

2.5.5 Sources of Information

In order to be able to adopt new technological improvements, the farmer must be aware of the innovation and familiar with its usefulness. This information is needed to be able to weigh the advantages of the innovation against the disadvantages, and in this way to minimize risk (Alberta Agriculture, 1983). To become an informed user of the technology, the farmer must have access to relevant information.

In an early study of the role that agents of communication have in effecting technological change, Wilkening (1956) identified four categories of information sources: mass media, other farmers, agricultural agencies and commercial information sources. The mass media, which includes print, radio and television, was most effective as an early source of information on new technologies. The importance of mass media to farm operators has been identified in numerous other research studies (Blackburn et al., 1979; Napier et al., 1976; Brown and Collins, 1978). The second category of information sources, other farmers, was the most effective agent in the actual decision-making process to adopt or not adopt new technologies. The other communication agents: agricultural agencies, and commercial information sources were the most effective in providing instruction on how to initiate changes dictated by the new technology (Wilkening, 1956).

The data reported for the northwest region of Alberta Agriculture, from the 1984 report entitled, "Information Needs Study of Alberta Farmers and Farm Families", evaluated the importance of various types of information sources. The six most important sources of information were: Alberta Agriculture, district agriculturists, elevator agents, farm magazines and newspapers, neighbors and friends, and radio programs.

Schomaker and Thorpe (1963) found that as the level of education of farm operators increased, so did the amount of consultation with outside sources of information. Farm organizations also provide a central location for the communication of ideas. Research on involvement in farm organizations has shown that social participation in organizations is associated with early adoption of innovations (Rogers and Shoemaker, 1971). Rogers and Shoemaker (1971) found that early adopters of innovations tend to have more social participation, have greater exposure to mass media, more change agent contact, and seek more information about innovations than do later adopters.

The majority of farm operators do not belong to any farm organizations. Jacobsen (1969) reported that those who do join farm organizations tend to be younger, have larger farms, higher than average gross farm incomes, more formal education, and less off-farm employment. Blackburn et al. (1979a) also reported that farmers with higher gross sales tended to have more involvement in social organizations.

Contrary to the above finding, a study of dairy farmers by Poole (1981) found that with increases in each of farm size, the degree of mechanization of the farm operation, and income level, the amount of participation in community organization decreases. This decrease in organizational involvement occurs because as the farm becomes more mechanized, the complexity of farming increases and people find that they have less time available for social activities.

2.5.6 Record Keeping As a Source of Information

An additional source of farm management information is that which is found in farmers' record books. The farm accounting system, which is a record of the financial status of the farm operation, is a means of storing relevant farm management information in memory. These records overcome the limitations imposed by human memory and, as such, the farm accounting system is an important source of information for decision-making.

Castle, Becker and Nelson (1987) identify three purposes of farm accounting. The first purpose of farm accounting is for assistance in the preparation of financial reports which would be required for income tax purposes, loans, or farm program applications. The second purpose of accounting is the diagnoses of deviations from the expected level of performance. This will identify strengths or weaknesses of the farming operation which may require attention. The third purpose of farm accounts is their assistance in the planning of future endeavors for the farm operation.

Carlson (1988) found that although farmers realize that record keeping is an important function, they tend not to prioritize this when making important farm decisions. This lack of appreciation for the utility of accurate record keeping is noted throughout the literature. A 1984 study (Adamowicz et al., 1984) of Alberta farmers found that the majority of respondents in a random sample used only a single entry record keeping system for their farm records, and only one percent used a microcomputer.

2.5.7 Managerial Ability

Dillon (1980) refers to farm management as the "... process by which resources and situations are manipulated by the farm manager in trying, with less than full information, to achieve his goals." "Managerial ability" refers to the psychological ability of the farm operator to perform the act of managing the farm operation (Gibbs and Lamacraft, 1984). A central component of management is the making of decisions. The operators of the family farms are faced with a wide range of management decisions in the areas of production, marketing, finance, personnel, household and family matters.

Previous research in the area of farm management and farm decisions has used many different factors in the measurement of managerial ability. The measure of management ability used by Blackburn et al. (1979) was based on responses to questions about education, fertilization practices, herbicide and insecticide use, livestock selection practices and the use of financial and production records. Lower income farmers tended to score lower on the scale of managerial ability than the larger commercial farmers.

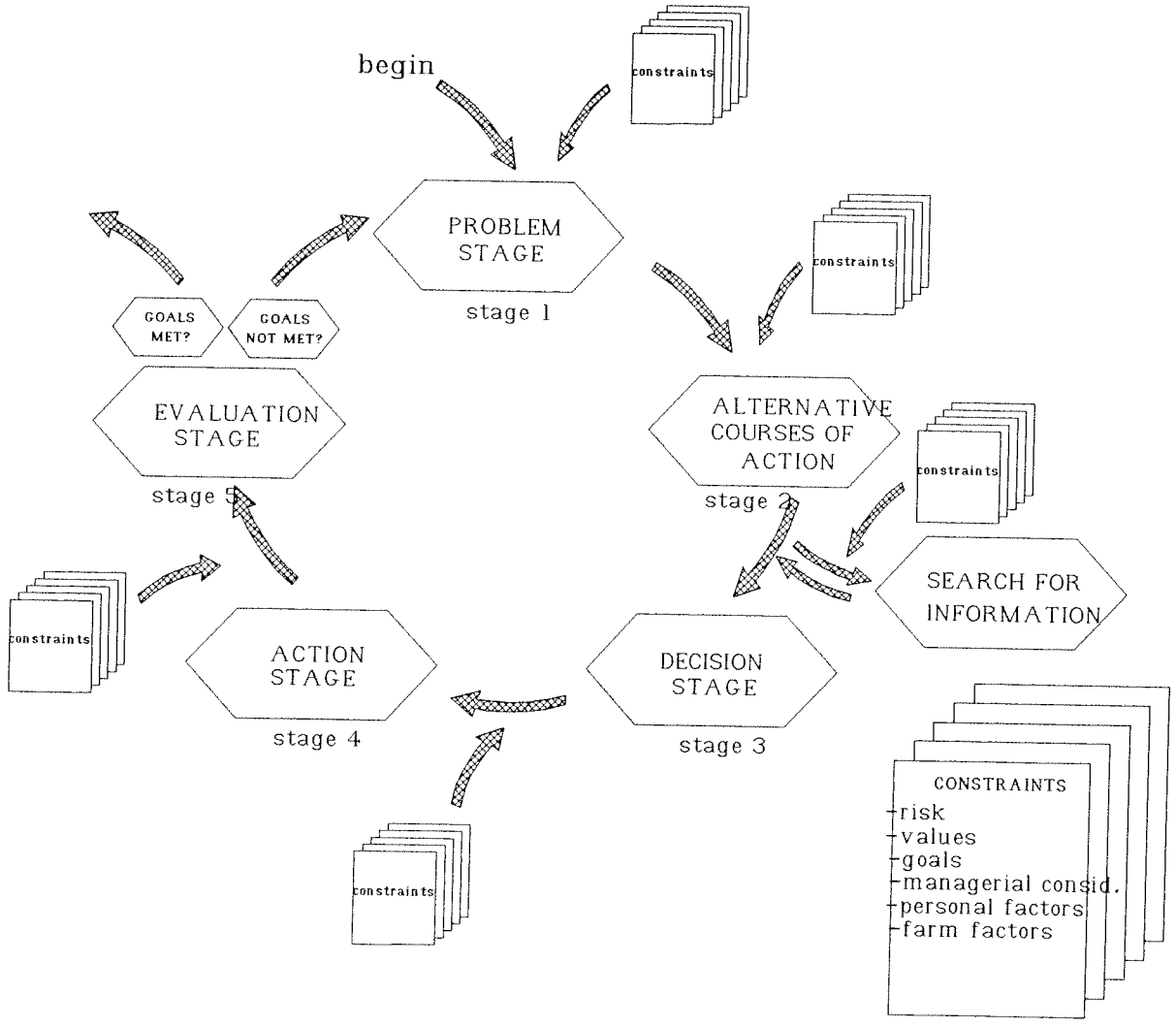
Brien, Wrigley and Jardine (1965) operationalized managerial orientation as being the average of "conceptual skill" and "exposure to the Department of Agriculture." Exposure to the Department of Agriculture was seen to be a sign that the farm operator actively sought technical advice. In their study, the significance of managerial orientation was that it facilitates farmer adaptation to changing conditions.

Frequently, managerial ability has been measured by the financial success of the farm operation. Because of the influence of neoclassical economics, many studies have considered farm management decisions to be guided by fundamental economic principles. The quest for profit has been recognized as the most important goal of farm operators, and as a consequence, much of the research has evaluated farm managers on the basis of the achievement of the goal of maximizing profit.

2.6 The Family Farm Management Decision Process: A Framework

The theoretical basis for literature review is presented in Figure 1. The decision-making process of the farm operator is influenced by constraints in the form of personal characteristics of the farm operator and the farm firm, risk preference, personal orientation as derived from goals and values, external constraints, and managerial ability. In a sense all farmers are faced with similar problems but their actual decisions vary because they have different goals, different levels of knowledge and they vary in their aversion to risk and uncertainty.

FIGURE 1
THE FRAMEWORK OF THE FARM DECISION-MAKING PROCESS



Adapted from: L. Bauer, "Risk in Agriculture and its Management." Class notes for Agriculture Economics 400, University of Alberta, 1987, and J.H. Cleave, "Decision Making on the African Farm," in *Contributed Papers Read at the 16th International Conference of Agricultural Economists*, ed. by International Association of Agricultural Economists (Oxford: International Association of Agricultural Economists, 1977).

It is important to note that the constraints influence the decision-making process at every stage. The constraints affect the number and types of alternatives that are considered, the information search, whether a decision will even take place, how the action will be implemented, and the continual evaluation that takes place.

3 DESIGN AND METHODS OF RESEARCH

3.1 The Setting of the Study

The study was conducted in an area situated in Central Alberta that includes County 7 (Thorhild), County 11 (Barrhead), County 12 (Athabasca), County 20 (Strathcona), County 25 (Leduc), County 28 (Lac Ste. Anne), County 31 (Parkland), Improvement District 14, Improvement District 15, Municipal District 90 (Sturgeon), Municipal District 92 (Westlock) and Edmonton. These areas encompass Census Divisions 13, 14 and part of 11, Alberta Agriculture refers to this region as the Northwest Region or Region 5.

The land base in the Northwest region consists of an area encompassing 6.05 million hectares. A significant portion of this land is public land, classified as a Green Area, and is largely unsettled and heavily forested, which makes it unsuitable for most agricultural purposes except grazing. The 11,875 farm operations in the region occupy 2,275,736 hectares of land, 1,582,471 hectares of which is improved land and 693,257 is unimproved.

There is considerable variation in the geographic characteristics of the region. This can have a significant impact on how decisions are made by limiting the alternatives that are available to the decision maker. The following geographic factors limit choice in farm decision-making in various areas of the region: existing soil types (grey wooded, black, peat, sandy, solonetzic and organic soils), excess acidity of the soil, excess precipitation, damaging frosts, short growing season, and topographical features which are not conducive to farming.

Because of the variation in geographical factors, there is considerable variation in farming operations from all types of crops to many livestock operations. Cow/calf operations tend to predominate in the western region of the study area because of the conditions that exist in the area that are not conducive to growing crops, such as poor soil types and a short growing season. The majority of hog operations in the study area are found in the area surrounding Barrhead. The majority of dairy operations are found in an area southeast of Leduc. Crops tend to be dispersed throughout the region, with specific varieties occurring in pockets of similar geographic conditions.

There are many opportunities for farm operators in the region to supplement their income with off-farm employment. The presence of the large urban population centers provides many employment opportunities. In addition the forestry and oil/gas industries, which are dispersed throughout the region, periodically offer lucrative job opportunities. The existence of the opportunity for off-farm employment will impact the manner in which some farm decisions are made, by providing alternative choices for sources of income. Farm operators and their spouses in this region report a significant amount of off-farm work.

3.2 Research Objectives and Questions

To facilitate a thorough analysis of the research problem, a formal clarification of the research objectives was deemed necessary. The research questions that evolved were: (1) What is the nature of the relationship between a farm operator's personal and farm firm characteristics and their personal orientation, as derived from their goals and values? and (2) What is the nature of the relationship between the personal orientation of farm operators and the amount of managerial consideration employed in their

decision-making process? To answer these questions, data on socio-economic characteristics of farmers, on farm firm characteristics, on personal orientations, and on farmers' managerial considerations in decision making, were required.

3.3 Sample Selection

After the initial literature review, in depth interviews with selected farmers from the study area were conducted. The purpose of these interviews was to provide preliminary understanding of the decision-making situation on the farms. Such an understanding was considered essential for the design of the mailed questionnaire for collection of data from a larger sample of farmers. To ensure that the data were representative of the entire population, a probability sample was selected on a systematic random basis from the 11,875 farms in the Northwest region. The sample size was dictated by the desire to achieve a 90 percent level of confidence with a five percent level of precision. These parameters mean that the proportion derived from the study sample should be within 5 percent of the proportion that characterizes the entire universe 90 times out of 100. For the purposes of the calculation of sample size, the proportion of the population who exhibit non-economic goals was estimated to be 40 percent (Pemberton and Craddock, 1979). From *Tables for Determining Sample Size and Sample Error*, the sample size required to satisfy the above conditions was determined to be 253 (Portman et al., 1975). The actual sample size was increased to 600 to compensate for the low rate of response that is usually experienced by questionnaires administered to farm populations.

The sample selection was performed with the assistance of Statistics Canada. Because of their concern with confidentiality, Statistics Canada researchers in Ottawa performed the actual selection of the sample using the sample framework supplied to them by the project researchers.

3.4 Design of the Instrument of Observation

The format of questions chosen for inclusion in the questionnaire were of the following types: close-ended questions with ordered answer choices; close-ended questions with unordered answer choices; partially close-ended questions, which provided the respondent the opportunity for adding categories of response that were not foreseen by the researcher; scales; and rank ordering of categories. To achieve a high rate of return, attention was paid to the physical design of the questionnaire, which consisted of twenty questions and required approximately twenty-five minutes for completion by the respondent. The length of the questionnaire was kept short to avoid annoying the respondents, by asking too much of their valuable time.

The pretesting of the questionnaire was undertaken in two stages of the project. The first draft of the questionnaire was pretested with in-depth interviewees. On the basis of the first pretest the questionnaire was revised. The second pretest was performed on farm operators, Alberta Agriculture field staff, and colleagues in the Department of Rural Economy. Analyses of the second pretested questionnaires yielded information as to the reliability and validity of the survey instrument. As a result of this pretest, further modifications of the instrument were undertaken.

3.5 Response Rates

After the first mailing of the questionnaires, the rate of response was high with 204 usable questionnaires returned. The response to the second mailing of the questionnaire was somewhat lower with another 67 usable questionnaires being returned. A total of 271 questionnaires were received (45%). If one considers the 38 unopened questionnaires which were returned because of incorrect addresses, the rate of return for this study is 48.22%.

3.6 Analysis and Interpretation of Data

As the completed questionnaires were received, they were read and edited for obvious errors. Thorough consideration was given to each problem and, where possible, errors were corrected. The tendency was to leave respondents' comments unchanged, because of the difficulty and potential for error in 'second guessing' the respondents' intention by responding in that manner. The data in the questionnaire were coded and codes were entered into a computer file. The data were subjected to analysis using SPSSx language on the University of Alberta MTS Computer System. Using the SPSSX commands, the scores for risk preference, organizational involvement, personal orientation and the score of managerial consideration were calculated.

Managerial consideration was calculated by summing the responses to the questions on information consultation, importance of market and agronomic conditions, fertilizer decisions, frequencies of soil tests and profit calculation, decision-making tools used in the acquisition of capital assets, maintenance and the use of financial records and the use of microcomputers in record keeping.

The frequencies of response, means, modes, percentiles, percentages of the responses to the descriptive, nominal, and ordinal questions of the questionnaire were calculated and presented in frequency tables. These data were then analyzed inferentially using cross tabulation, chi-square, t-tests, pearson rank-order correlation, and analysis of variance to determine the influence of all identified factors on decision-making.

4 FINDINGS OF THIS STUDY

4.1 Demographic and Family Characteristics of Farm Operators

Data collected about the personal characteristics of the respondents were used to assist in the testing of the hypotheses. Data were collected on age, marital status, education, number of children and the amount of off-farm employment of the respondents.

The age of farm operators in the study ranged from 24 years to 80 years, with the mean age being 50.8 years. The modal age of farm operators was 52 years. According to the 1986 Census of Agriculture data for Alberta, the modal category for age of farm operators is in the range of 50 to 54 years. Thus, the sample data for age appears to be representative of the actual age as derived from census data. The age of the spouses of farm operators tended to be lower than their partners. The range of ages for spouses was from 24 to 78 years, with the mean being 47.3 years.

The stage of the family life cycle, as has been explained earlier, will affect the decision making process. For example, farmers at an earlier stage of the family life cycle are more likely to be involved in off-farm employment, because their financial requirements are higher due to the presence of a young family. A household at a more advanced stage of the family life cycle is less likely to perform off-farm employment because the family is more mature. There is less chance of the family having dependent children and not as much need for extra income. The stage of the family life cycle most frequently reported in this study is that where the operator is over 45 years of age and any children present are over the age of 19. The presence of a high percentage of households in this category is partly explained by the fact that the average age of operators in the sample is high, at 50.8 years.

Research has identified a positive correlation between marital status for male farm operators and farm success. Unmarried males earn significantly less than their married counterparts (Tigges and Rosenfeld, 1987). Of the respondents who answered the question about marital status in this study, 84.8 percent reported that they were married.

Many studies of farm families assume that there is one person in the family who is considered to be the farm operator. Since most decisions concerning the farm operation affect the entire family, the decision process will frequently involve more than one person. A question was included in the survey to determine who, in the family unit, is considered to be the farm operator. The answer choices provided were 'husband', 'wife' and 'both'. Only those respondents who reported that they were married were asked who was considered to be the farm operator. The results show that 55 percent of the respondents considered the husband to be the farm operator, while 44 percent considered both the husband and wife to be the farm operators.

Similar to the age of the farm operator, the length of time worked on a farm will influence the accumulation of experiences from which to draw to assist in decision-making. A potentially negative consequence of the increased length of time spent in farming is the reduced willingness to consider new technologies. The respondents were asked to identify the number of years that they had been working on their current farm. The range in the number of years was from 2 to 75 years. The mean number of years on the current farm was 24.7 years.

In addition to the length of time that the respondents have been operating on the current farm, the bank of experience from which to draw information will be influenced by the length of time that the farm has been operated by the current operator(s) and their predecessors. Also, a farm that has been in the family for a long period of time is less likely to suffer from the debt load and financial stress than a newly established farm. The range in the number of years that the farm had been owned by the current farm operators and/or their predecessors was from three years to 108 years. The mean number of years that the farm had been in the family was 39.1 years. There were four major peaks in the distribution at ten, fifteen, twenty-five and sixty years.

The number of generations of a family that are currently living and working together impacts decision-making in a similar manner to the length of time that a farm has been in a family. Respondents were asked to specify how many generations of their family were currently living and working on the farm. The majority of respondents (54.3%) reported that only one generation was currently on the farm. Thirty-eight percent had two generations of the family living on the farm, and only 7.8 percent had three generations of the family on the farm.

4.2 Education of Farm Operators

With the complexities inherent in farming, a formal education is now viewed as a requisite for a career in farming. Previous research has supported the presence of a relationship between the level of education and willingness to consider the adoption of new technologies (Albrecht and Ladewig, 1985). Respondents were asked to record the highest level of educational attainment of the farm operator and spouse. The modal category for the highest level of education achieved by the farm operators was from grades 7 to 9.

The data indicate that spouses have a higher level of educational attainment than do their partners. The modal educational attainment for the spouses is the completion of high school. This finding is supported by previous research that farm women are generally more educated than farm men (Noble, 1967). Historically, it was common for men to leave high school before graduation to assist in the operation of the family farm. Since women's involvement in farm work was not as highly valued as men's they were more likely to stay in school and complete their high school education.

These data indicate that farm operators tend to conclude their education before the completion of high school. Fifty-three percent of the operators in the sample did not complete high school. However, of those who continued beyond high school, there is a significant number (10.6%) who completed university. A similar trend exists in the data for educational attainment of the spouses. The majority of spouses (60.2%) completed high school, but few continued beyond high school. 9.7% of the spouses completed a university degree, as shown in Table 1.

TABLE 1
EDUCATIONAL ATTAINMENT OF FARM OPERATOR AND SPOUSE
(percentage of respondents)

Highest Level of Education Achieved	Farm Operator (n=265)	Spouse (n=216)
No Formal Education	0.4	0
Grades One to Six	5.3	0.9
Grades Seven to Nine	25.7	15.3
Some High School	21.9	23.6
Completed High School	16.2	31.5
Some College	6.4	7.9
Completed College	9.4	7.9
Some University	4.2	3.2
Completed University	10.6	9.7

4.3 Off-Farm Work by Farm Operators

Farm family members seek employment off the farm for a variety of reasons. Participation in employment off the farm increases the exposure of the individual to people who may have interests and attitudes different from their own. Because of potentially different values and attitudes, the decision processes on a farm, where the operator and spouse are employed off the farm part time, will be different from a farm where there is no off-farm employment. For both farm operators and their spouses, the majority in the sample performed less than one week of work (in one year) off the farm. A slightly higher percentage of spouses performed more off-farm work than farm operators did. In addition, respondents were asked to record the actual percentage of their total income that was derived from off-farm work. The results ranged from zero to one hundred percent, with the mean being 31.1 percent of total income.

4.4 Farm Firm Characteristics

An understanding of economic well-being is essential to analyzing the process of making decisions. Frequently, studies of farm populations report gross sales as an alternative measure of economic well-being. It provides a basis of comparing the economic activity of farm households. In an analysis of farm household decision-making, gross sales is an important factor. Previous research has linked gross sales with early adoption of innovations (Bultena and Hoiberg, 1983). In part, the difference in the type of decisions considered will be influenced by the ability to tolerate risk. A farm household with a high level of gross sales can tolerate more risk, and will contemplate more risky decisions, than will a farm with a lower level of gross sales. The category most frequently recorded by respondents was the gross sales range from $25,000 to $49,999 with 20.5 percent of the respondents reporting that category. The two next most frequently reported categories were those from $2,500 to $9,999 and from $50,000 to $99,999, both at 18.5 percent.

Farm size provides another indicator of the level of economic activity of a farming operation. The farm households in the sample reported operating on an average of 568.9 acres. The range of total acres operated was from 5 acres to 4086 acres. The modal category was 160 acres which corresponds to one quarter section. The mode is much lower than the mean because there were a few respondents in the study

who reported farming on very large numbers of acres. These few extreme responses cause the mean, which represents the average response, to be much higher than the mode, which represents the most frequent response.

The respondents were asked to identify, of the total acres operated on, how many were rented and how many were owned. The mean number of acres rented was 383.5 with the range being from 10 acres to 2500 acres. The modal category was again, 160 acres. The disparity between the mean and the mode is caused by a few extremely large responses.

The mean number of acres reported as owned by farm households in the sample was 378.8 with the range being from 5 acres to 2586 acres. The modal category of 160 acres, again was much different from the mean due to a few extreme responses.

To allow for comparison with other studies, the participants were asked to record the type(s) of agricultural enterprises engaged in their operation. The enterprises that were reported with the greatest frequency are hay, pasture, barley, cow/calf and oats as reported in Table 2.

TABLE 2
TYPES OF ENTERPRISES REPORTED IN THE STUDY
(percentage of respondents)

ENTERPRISES	Number of Operations	Percent of Total Operations	Number of Units	Mean Number of Units
Hay in Acres	179	66.1	31645	176.8
Pasture in Acres	162	59.8	25137	156.6
Barley in Acres	159	58.7	30391	191.1
Cow/Calf Number	145	53.5	8865	61.1
Oats in Acres	131	48.3	10160	77.6
Feeder Cattle Number	78	28.8	3739	47.9
Fallow in Acres	76	28.0	5565	73.2
Horses Number	62	22.9	478	7.7
Oilseeds in Acres	54	19.9	8035	148.8
Wheat in Acres	53	19.6	5381	101.5
Poultry Number	42	15.5	18695	445.1
Pigs Number	35	12.9	5743	164.1
Dairy Cows Number	29	10.7	1082	37.3
Dairy Calves Number	26	9.6	1042	40.1
Other Field Crops in Acres	20	7.4	2843	142.2
Other Grains in Acres	15	5.5	1234	82.3
Sheep Number	10	3.7	133	13.3
Sod/Nursery in Acres	7	2.6	188	26.9
Greenhouses in Square Feet	3	1.1	664	221.3

4.5 Attitudes and Behaviors of Farm Operators

In order to assist in the testing of the hypotheses, the attitudes and behaviors of the respondents were studied. Information was collected about involvement in farm organizations, personal orientation and risk preference.

4.5.1 Organizational Involvement

A study by Dean, Aurbach and Marsh (1958) demonstrated that farm operators with more participation in formal organizations exhibited more 'rationality'. In this study, rationality was defined as "the use of deliberation, planning and the best available sources of information and advice in arriving at decisions as a means of achieving ends". The respondents of this study were asked to identify any organizations that they had participated in and to record the amount of involvement. The data on organizational membership in 17 organizations listed on the questionnaire is available in Moerth (1990:64). United Farmers of Alberta (68.3%), Alberta Wheat Pool (59.4), Church Groups (27.3), Community associations (23.68), United Grain Growers (21.4%), Cattlemen's Association (16.6%), were the highest listed organizations to which responding farmers belonged. Despite the high percentage of membership in these organizations, few respondents reported that they have ever been involved as officers, or that they attend meetings regularly. Respondents indicated the most involvement as officers and regular attendance in church groups and community associations.

A score used to summarize and weight individual respondent's involvement in organizations was computed from raw data by assigning numerical values to participation levels. The scores ranged from zero to twenty-five. The mean participation score was 4.75.

4.5.2 Personal Orientation

To study the business and social value orientations, the respondents in this study were presented with a variety of goal statements and asked to state their level of agreement with each statement on a Likert type scale. The level of agreement indicated with statements about specific goals provides insight into the personal values held by the individual. The data are presented in Table 3. The goal statement with the lowest mean value for agreement is "Financial Security", with a mean of 2.35 and a standard deviation of 1.42. A possible explanation for the low level of agreement with the goal of financial security is the statement, "It is very important to me to make profitable investments in my farm by using borrowed money", which has two distinct components. It is possible that the respondents could have agreed with the goal of making profitable investments, yet could have disagreed with using borrowed money to make those profitable investments.

To identify the respondent's personal value orientations, the goal statements were classified into two categories. The first category contains the goal statements that embody a financial or "business" orientation. Agreement with the goal statements labelled "Labour Income", "Financial Security", "Business Growth", and "Investment Income" indicates a business orientation. The alternative category contains statements labelled "Continuity", "Healthy Lifestyle", "Social Recognition", and "Leisure Time" which can best be classified as being of a "social orientation". Each individual respondent was assigned a score for his business and social orientation based on the evaluation of his goal statements. The four categories of orientation and their distribution which emerged from the analysis are given in Table 4.

TABLE 3
REPORTED AGREEMENT WITH GOAL STATEMENTS

Goal Statement	1 Strongly Disagree	2	3	4	5 Strongly Agree	Mean	Standard Deviation
1). (Healthy Lifestyle) One of my main reasons for farming is to be able to provide a healthy lifestyle for my family	4.7	5.0	14.7	18.2	57.4	4.19	1.15
2). (Business Growth) A major goal for me is to have my net worth increase from year to year.	5.1	7.9	19.0	26.1	41.9	3.92	1.18
3). (Labour Income) One of my major goals is to operate a farm business that will pay a wage similar to any other business.	5.1	7.1	23.9	18.8	45.1	3.92	1.20
4). (Investment Income) A major concern of mine is to have a modern farm business that will give a return on investment comparable to any other business.	6.0	9.9	15.9	28.6	39.7	3.86	1.21
5). (Continuity) It is very important to me that the farm stay in the family for at least the next generation.	10.7	13.8	19.4	19.4	36.8	3.58	1.38
6). (Leisure Time) A major goal of mine is to have time available to spend in leisure activities.	10.6	15.4	31.5	24.0	18.5	3.24	1.23
7). (Social Recognition) It is important to me to be recognized as a top farmer in my area.	29.1	16.9	28.3	15.0	10.6	2.61	1.33
8). (Financial Security) It is very important to me to make profitable investments in my farm business by using borrowed money.	40.7	19.0	17.3	10.5	12.5	2.35	1.42

TABLE 4
PERSONAL ORIENTATION OF RESPONDENTS

Orientation	Frequency	% of respondents
High Business/High Social Orientation	55	21.4
High Business/Low Social Orientation	62	24.1
Low Business/High Social Orientation	45	17.5
Low Business/Low Social Orientation	95	37.0
Total	257	100

4.5.3 Risk Preference

To determine the level of respondent's propensity for risk, a series of five statements related to attitudes toward risk were presented. The respondents were then asked to identify their level of agreement with the statements, on a Likert Scale. The statements which evinced the strongest agreement were oriented toward a low risk preference. The highest mean score calculated was 2.84 for the statement of: "I would rather stay with a proven practice than switch to a new one even if the new one looks more profitable." The standard deviation for this statement is 1.28. The lowest mean score was derived for the statement of: "I tend to take more financial risks in my farming operation than do most other farmers in my community." The mean score for this statement is 2.29, with the standard deviation of 1.19.

4.6 Managerial Consideration Score: The Components

The decision-making process is cyclical in nature, and as a consequence, is difficult to quantify. However, specific components of the process are amenable to measurement. The particular parts of the questionnaire data that are included in the managerial consideration score are: information contacts, use of microcomputer, methods of keeping financial records, use of financial records, perceived importance of cropping considerations, frequency of soil tests, frequency of profit calculation, and reasons for and techniques used in making asset acquisition decisions. The data collected on these subjects, presented in the following sections, were used only for the purpose of deriving the managerial consideration score.

4.6.1 Information Sources

The search for information is a crucial element of the decision-making process. The survey respondents were asked to report the frequency with which they contacted various communicating agents for farm management related information. The majority of respondents indicated that they had at least one contact per year with the mass media. Newspapers/magazines, was identified by 97.3 percent of respondents, radio by 93.8 percent of respondents and television was listed by 87.0 percent of respondents. The large number of people who reported contact with the mass media was not unexpected given the large presence that mass media has throughout society.

A large number of respondents reported contact each year with agricultural agencies. District agriculturists were contacted by 84.5 percent and government publications were used by 83.9 percent. Fewer respondents reported contact with federal research (52.9 percent), county fieldmen (49.8 percent), district home economists (41.5 percent) and universities/colleges (30.7 percent).

Commercial sources were contacted by a significant number of respondents. Most reported contact with tax advisors (82.3 percent), elevator agents (81.7 percent), suppliers (77.2 percent) and bankers (61.4 percent). Fewer respondents indicated contact with lawyers (27.5 percent) and brokers (14.8 percent). There was also a significant amount of contact with other farmers. Friends/neighbors was mentioned by 90.6 percent of the respondents.

In addition, respondents recorded extra information sources in the "other" category. Three agriculture related organization sources: Canadian Wheat Board, Alberta Wheat Pool and Cattle Commission; and one commercial source: Farm Management Consultant were recorded. One respondent recorded that he/she gained farm management information by visual observations on trips or vacations.

The actual frequency with which respondents consulted the various sources of information is presented in Table 5. The frequency of contact with information sources differs depending on the "necessity" of frequent contact. For example, 31.4 percent of respondents indicated that they contacted newspapers and magazines once per week, while zero percent of respondents indicated that they contacted tax advisors once per week. This does not necessarily mean that farm households rely on newspapers for more farm management information than they rely on tax advisors. Rather it means that it is only necessary to contact tax advisors once or twice per year, while it is necessary to read newspapers and magazines more frequently. Thus, it is important to consider the type of information source when interpreting the data in Table 5.

To derive a score, for use in analysis that measures the quantity and frequency of information and contacts, numerical values were assigned to each of the response categories, with the numerical value increasing as the frequency of contact increased. A composite score for information and contacts was computed for each respondent.

The information contact scores ranged from one to sixty-three, with the mean being 27.48. To permit later inclusion as part of the managerial consideration score, the information score was then condensed into three categories. Scores ranging from one to twenty were assigned a value of one, corresponding to low managerial consideration. The range of scores from twenty-one to forty were assigned a value of two. The scores ranging from forty-one to sixty-three were assigned a value of three which corresponds to high managerial consideration.

4.6.2 Use of Microcomputers

Another component of the managerial score is the use of the microcomputer. As computer technology continues to develop at an increasingly fast pace, the applicability of that technology is also increasing. A large majority of the respondents in the survey, however, did not own or use a microcomputer to assist them in their record keeping. Out of 268 respondents in this study, nineteen (7.1 percent) reported that they keep their records on a microcomputer, while 249 (92.9 percent) did not. The percentage of computer users in this study is high compared to the 1986 Census data which indicates that 2.1 percent of farmers in the Northwest Region used microcomputers, indicating a possible trend towards increased use of microcomputers for farm records. The use of microcomputers for farm record keeping was considered a component of the managerial score. This information, as is explained below, was used in computing the managerial consideration score.

TABLE 5
FREQUENCY OF CONTACTS WITH INFORMATION SOURCES
(percentage of respondents)

Information Source	Frequency of Contacts							
	Never	Once Per Year	2-6 Times Per Year	Once Per Month	2-3 Times Per Month	Once Per Week	More Than Once Per Week	No Response
Newspapers/Magazines	2.6	3.7	7.0	16.2	15.5	31.4	19.2	4.4
Radio	5.9	1.8	3.3	3.0	5.9	12.5	62.0	5.5
Friends/Neighbours	8.5	6.6	29.2	19.2	14.0	7.4	5.2	10.0
Television	11.8	4.1	8.5	4.8	6.3	15.9	39.9	8.9
District Agriculturalist	14.4	27.3	32.5	13.3	4.8	0.7	0	7.0
Government Publications	14.4	20.3	25.8	17.3	6.6	4.4	0.4	10.7
Tax Advisors	16.2	44.6	26.6	3.0	1.5	0	0	8.1
Elevator Agent	17.0	16.6	30.6	12.9	9.6	4.1	2.2	7.0
Suppliers	20.7	18.1	24.7	14.4	8.5	3.7	0.7	9.2
Bankers	35.1	23.6	19.2	10.0	2.2	0	0.7	9.2
Federal Research	41.3	22.1	14.4	6.3	3.3	0.4	0	12.2
County Fieldman	43.2	27.3	11.4	1.8	1.1	0.7	0.4	14.0
District Home Economist	50.9	20.7	11.1	1.8	1.8	0.7	0	12.9
Universities/Colleges	60.9	16.2	5.2	3.7	1.8	0	0	12.2
Lawyers	63.1	20.3	3.7	0	0	0	0	12.9
Brokers	74.5	7.0	2.6	1.5	1.5	0	0.4	12.5

4.6.3 Methods of Keeping Financial Records

Respondents were asked to identify the type of financial records that they kept. All respondents kept some form of financial record, with the modal category being 'single entry' record books as indicated in Table 6. The 'other' categories in the table refers to 'using an accountant or a computer program'.

TABLE 6
TYPES OF FINANCIAL RECORDS MAINTAINED BY RESPONDENTS

Type of Record	Frequency	% of respondents
Bills and Receipts Only	85	31.6
Single Entry Records	124	46.1
Double Entry Records	49	18.2
Other	11	4.1
Total	269	100

The financial records data keeping were further analyzed to allow for their inclusion in the managerial score. Responses to "Bills and Receipts Only" were assigned a managerial score of one. A managerial score of two was assigned to "Single Entry Records" responses. A managerial score of three was assigned to responses in the categories of "Double Entry Records" and "Other". In addition, use of microcomputers in record keeping was assigned a value of three in the managerial consideration score. Using these scores as well as data on the use of records, respondents were classified into Low Managerial Consideration Group (26.4%), Medium Managerial Consideration Group (14.1%) and High Managerial Consideration Group (59.7%).

4.6.4 Relative Importance of Factors in Farmers' Cropping Decisions

The results of the respondents' ranking of the three most important cropping considerations are shown in Table 7. Price was ranked as the most important factor by 41 percent of the people in the sample.

The cropping factors were further grouped into three categories, i.e., (1) those of agronomic nature, (2) related to markets and (3) those factors which concern farmers' personal experiences with crop growing. A score was then calculated from the reported importance of each category of these factors by assigning numerical values. These scores were then used in compulation of managerial consideration scores.

TABLE 7
RANKING OF THREE MOST IMPORTANT CROP FACTORS
(percentage of respondents)

Factor	Factor Ranked Most Important (n=249)	Factor Ranked Second Most Important (n=245)	Factor Ranked Third Most Important (n=239)
Current Crop Prices	41.0	11.4	7.1
Soil Characteristics	12.0	7.3	9.6
Market Opportunities	10.0	19.2	13.4
Spring Soil Moisture	10.0	13.1	7.5
Past Personal Experience	7.6	7.3	20.9
Weed/Disease Problems	6.4	15.9	11.3
Annual Rainfall Amount	5.6	10.2	14.6
Length of Growing Season	4.8	10.6	11.7
Neighbor's Experience	1.6	1.2	1.7
Transportation Availability	0.8	3.7	2.1

4.6.5 Fertilizer Decisions

The respondents were asked to indicate the criteria used to make decisions about fertilizer use. As information in Table 8 indicates, experience figured heavily in farmers' decisions. In this table the percentages do not add up to 100 because the respondents were permitted more than one response to this question.

TABLE 8
CRITERIA USED BY RESPONDENTS IN FERTILIZER DECISION

Decision Criterion	Frequency	% of respondents
Experience	117	43.2
None Applied	73	26.9
Soil Test	73	26.9
As Much as Could Afford	56	20.7
Records	56	20.7
Dealer Aided Decision	41	15.1
Same Amount as Last Year	40	14.8
Family/ Neighbor Advice	14	5.2
Other	7	2.6

4.6.6 Frequency of Soil Tests

Thirty seven percent of the respondents indicated they do not perform soil tests on their farms. Frequencies with which the soil tests are performed by the remaining respondents are given in Table 9.

TABLE 9
REPORTED FREQUENCY OF SOIL TESTING BY RESPONDENTS

Soil Test	Frequency	% of respondents
Never	95	37.3
Once Every 3 Years	61	23.9
Once Per Year	36	14.1
Once Every 2 Years	29	11.4
Less Than Once Every 10 Years	11	4.3
Every 6 to 10 Years	9	3.5
Every 5 Years	8	3.1
Every 4 Years	4	1.6
More Than Once Per Year	2	0.8
TOTAL	255	100

4.6.7 Frequency of Profit Calculation

Respondents indicated that they performed profit calculation exercises with greater frequency than they did soil tests. In Table 10, it can be seen that the majority of respondents (60.6 percent) indicated that they calculated profit once per year. However, 15.3 percent reported that they never calculated profit.

TABLE 10
REPORTED FREQUENCY OF PROFIT CALCULATION BY RESPONDENTS

Profit Calculation	Frequency	% of respondents
Once Per Year	151	60.6
More Than Once Per Year	56	22.5
Never	38	15.3
Once Every Two Years	2	0.8
Once Every Three Years	1	0.4
Once Every Four Years	1	0.4
TOTAL	249	100

4.6.8 Reasons for Decision to Acquire Assets

Respondents were asked to consider their most recent capital asset acquisition decision. They were also asked to identify the conditions or situations that first made them realize that they needed such an asset. The results, presented in Table 11, indicate that the most frequently reported reasons was that the new asset would make the operation more efficient. It should be noted that the percentages are not cumulative, as respondents were permitted to record more than one response to the question.

TABLE 11
CRITERIA IN ASSET ACQUISITION DECISION

Decision Criterion	Frequency	% of respondents
New Asset Would Make Operation More Efficient	120	44.3
Forced to Acquire (Breakdown)	94	34.7
Operation Expanded	72	26.6
Tax Reasons	35	12.9
Other: Spare Money Available	26	9.6
Regular Purchase	25	9.2
No Reason	9	3.3
Neighbor Had Asset	1	0.4

4.6.9 Techniques Used in Asset Acquisition Decision

Further to the previous question about the decision to acquire an asset, the respondents were asked to record what techniques they used in reaching the decision to acquire or not to acquire the asset under consideration. The most frequently recorded category, as shown in Table 12, was that the decision was reached after an estimation of the costs and benefits of acquiring the asset (46.5 percent).

TABLE 12
TECHNIQUES USED IN ASSET ACQUISITION DECISION

Decision Technique	Frequency	% of respondents
Estimation of Costs and Benefits	126	46.5
Urgent Situation	65	24.0
Tax Reasons	45	16.6
Other: Functionality of New Asset	44	16.2
Bank Approval	34	12.5
Payback Analysis	23	8.5
Net Present Value Calculation	15	5.5
Formal Partial Budget	12	4.4

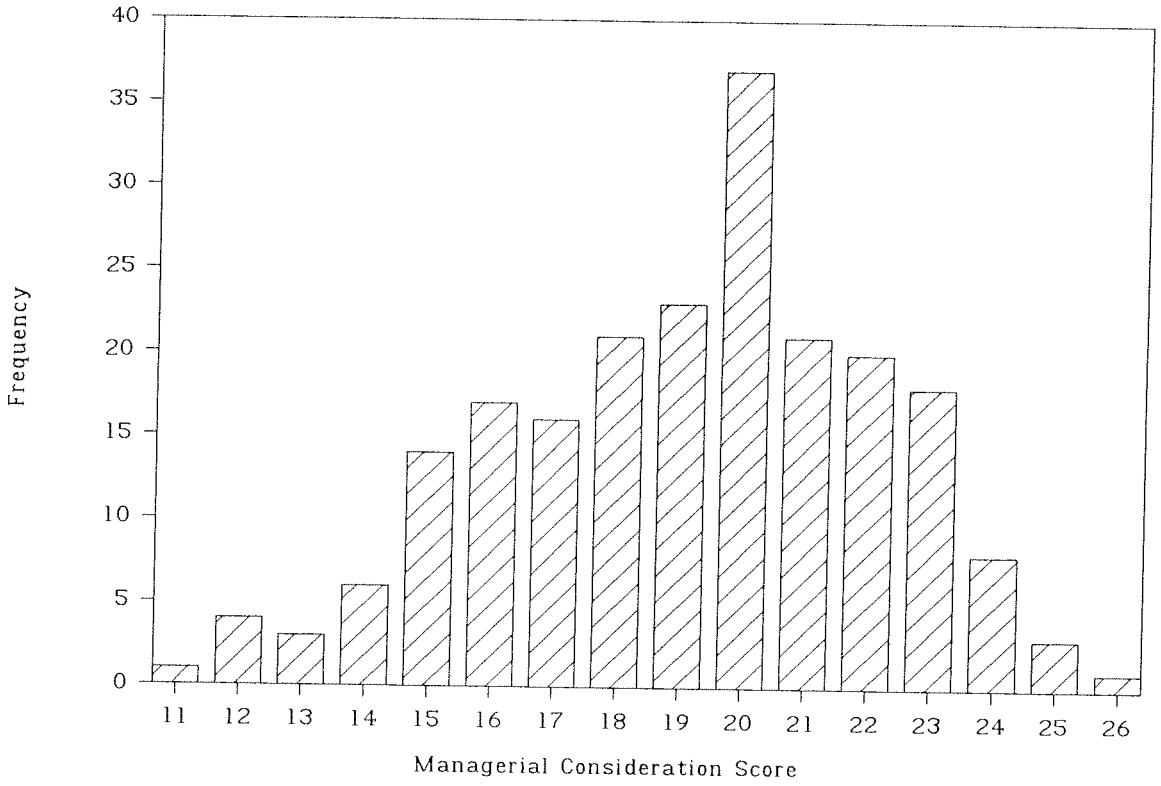
4.7 Managerial Consideration Score

The amount of managerial consideration that an individual exhibits in his/her decision-making behavior has a significant impact on the efficacy of their decisions. Because of the interconnectedness of the farm firm and the farm family, farm household decision makers need to consider a complex set of criteria in their decision-making. To allow for analysis of the decision-making process of the respondents, a managerial consideration score was computed. The component parts of the managerial consideration score are the number and frequency of information contacts, the importance of factors in cropping decisions (market, agronomic and experiential), frequency of profit calculation, frequency of performing soil tests, record keeping behavior, use of financial records, reasons for and techniques of decision-making in asset acquisition. The data reported for these components in the preceding sections were used for the calculation of the managerial consideration score for each respondent.

The managerial consideration scores ranged from sixteen to thirty, with the mean being 19.5 with a standard deviation of 3.01. The distribution of managerial consideration scores is presented in Figure 2.

The descriptive data analysis presented in the preceding pages are important to the study in order to provide an understanding of the variety of data collected. Additionally, it is important to derive an understanding of the characteristics of the sample in order to compare the results of this study to census data or other studies. The scores that were computed so far, i.e., the organizational involvement, risk preference, personal orientation, and managerial consideration scores, will be further analyzed in the inferential analyses presented in the following pages.

FIGURE 2
DISTRIBUTION OF RESPONDENTS' MANAGERIAL CONSIDERATION SCORES



5 SIGNIFICANT RELATIONSHIPS

The two major objectives of this study were: a) to establish the relationship between personal/farm/household characteristics and personal orientation of the farm operator and b) to establish the relationship between personal orientation and the extent to which managerial considerations were exhibited in the decision-making process. To test the hypotheses related to these objectives, the descriptive data presented in earlier sections were subjected to inferential analysis using SPSSx. The following statistical tests were used to perform analysis: differences of means test, test of independence, correlation coefficients and analysis of variance.

5.1 Personal Orientation and Socio-economic Characteristics

The first hypothesis, that strong business and personal orientation recorded by farm households were related with a specific set of socio-economic characteristics, was tested using difference of means test, test of independence and analysis of variance, depending on the type of data. For the purposes of analysis, a strong personal orientation score is classified as one which is 15 or greater on the business and social orientation scales, which range from 4 to 20. Detailed analysis of each variable and its association with high business and a social orientation is available in Moerth (1990). The condensed results of the analysis are presented in Table 13.

TABLE 13
SOCIO-ECONOMIC CHARACTERISTICS OF RESPONDENTS AS RELATED TO THEIR HIGH BUSINESS AND SOCIAL ORIENTATION

Characteristics	Significantly Related (yes/no) to High Business and Social Orientation
High industry organization involvement	yes
Longer time operator has been farming	yes
Farm not inherited by the operator	no
High gross farm sales	yes
Early in family life cycle	no
Younger age of the operator	yes
Younger age of the spouse	no
Greater amount of education of operator (& spouse)	no
Farm household with lesser community organizational involvement	no
Larger farm size	no
Larger amount of off-farm work (operator & spouse)	no
Greater risk tolerance by farm operator	no

5.2 Relationship Between Farm Operator Orientation and Managerial Score

The second hypothesis in the study is that farm operators from households which have strong business and social orientations will rank higher on the scale of managerial considerations in the decision-making process. The null hypothesis is that there is no difference in the managerial consideration score for the four personal orientation categories.

The results from the one-way analysis of variance that was used to test the relationship are presented in Table 14. The category with the highest managerial consideration score is the personal orientation combination of high business and high social orientation with a mean managerial consideration score of 21.1. The group with the lowest mean managerial score is the personal orientation of both low social and business scores, with a managerial consideration of 19.1. The F value of 7.93 is highly significant, so it can be concluded that the means are not equal. The Tukey-b multiple comparison procedure indicated each of groups 4,3 and 2 are significantly different from Group 1. Those farm operators who scored high on both the business and social orientation scales tended to have a higher managerial consideration score than those with both low business and social orientations. No significant differences were detected between groups 4, 3 and 2. However, the data provide support for the initial hypothesis that those with high business and social orientations will have higher managerial consideration scores than other personal orientation groups.

TABLE 14
ONE-WAY ANALYSIS OF VARIANCE OF MANAGERIAL CONSIDERATION BY PERSONAL ORIENTATION SCORE

Personal Orientation Groups	Mean	N
1. Low social and low business score	19.10	78
2. High social and low business score	20.53	34
3. Low social and high business score	20.90	49
4. High social and high business score	21.11	44
Total	20.20	205

$F = 7.93$ $p = 0.0001$

Tukey-b Multiple Comparison Test for Significantly Different Group Means ($p \leq 0.05$):
Group 4 and Group 1, Group 3 and Group 1, Group 2 and Group 1

5.3 Other Findings

An initial assumption of this study was that the two personal orientations being studied, business and social, were somehow in opposition. A farm operator was considered to have either a business or a social orientation. As the study developed, it became apparent that these orientations are not in opposition, but rather are complementary parts of the larger value orientation of the individual. Additional study of the relationship between social orientation and the personal and farm firm characteristics was suggested by the amount of correlation between business and social orientation discovered in the process of analyzing the data. The presence of correlation between the two orientations is indicated in the zero order correlation coefficient of 0.25 (significant at the 0.01 level). The assumption that business and social orientations are opposing characteristics was proven to be incorrect. The measure of personal orientation that was eventually incorporated into the hypotheses, and the preceding data analysis allowed the possibility, that farm operators could score high or low in both business and social orientation scales at the same time.

Earlier analysis, based on the assumption that business and social orientations are in opposition, yielded data that are presented in Table 15. To test the hypothesis that farm households with a strong business orientation will consist of younger decision-makers than those households which do not demonstrate a strong business orientation, a t-test was performed. The test was performed for both farm operators and spouses. The null hypothesis is that the population means are equal for those with a high or low business orientation. The results from the t-tests, shown in Table 15, indicate significant differences for both the age of spouse and operator between those with a high business and those with a low business orientation score. Significant differences were not, however, found in the ages of spouses or operators between those with a low social and a high social orientation score.

The test of the relationship between community organization involvement and personal orientation score yielded significant differences for those with high and low social orientation scores. The mean community organization involvement score for those with a high social orientation score was 3.00 and 2.15 for those with a low community organization score. No significant differences were found between high and low business orientation scores.

TABLE 15
INDEPENDENT VARIABLES WITH HIGH AND LOW BUSINESS AND SOCIAL ORIENTATION SCORES

Variable	Personal Orientation Score					
	High Business	Low Business	t-value	High Social	Low Social	t-value
Age of Operator	48.37 (114)	51.94 (140)	1.10**	49.74 (99)	50.97 (160)	-0.76
Age Of Spouse	45.53 (91)	48.06 (119)	-1.66*	46.12 (85)	47.68 (130)	-1.00
Community Org. Involve.	2.71 (117)	2.35 (141)	1.06	3.00 (101)	2.15 (162)	2.4*
Industry Org. Involve.	2.05 (117)	1.46 (141)	2.48**	2.01 (101)	1.54 (162)	1.9
Years of Operation	23.32 (115)	25.23 (141)	-1.07	27.33 (99)	22.72 (162)	2.56**
Years of Family Ownership	38.63 (109)	40.33 (136)	-0.53	45.41 (94)	35.42 (156)	3.14**
Total Acres Farmed	652.20 (116)	522.14 (139)	1.85*	651.52 (100)	527.30 (160)	1.75
Percent Inc. From Off-Farm	37.51 (102)	26.63 (126)	2.40**	34.54 (95)	28.95 (138)	1.22
Risk Score	12.87 (117)	12.27 (141)	1.24	12.42 (101)	12.38 (160)	0.07
Managerial Consideration Score	21.00 (93)	19.54 (112)	3.99**	20.85 (79)	19.77 (128)	2.83**

**Significant at the 0.01 level
*Significant at the 0.05 level

The industry organization involvement score for those with a high business orientation (2.05) was significantly higher than the score for those with a low business orientation score (1.46). There was no significant difference detected between those with high and low social orientation scores.

The results of the t-test for the length of time that the farm operators have been working on the current farm, shown in Table 15, indicate that those with a high social orientation score have been farming on the current farm for a significantly longer period (27.3 years) than those with a low social orientation score (22.7 years). There was no statistically significant difference found for high and low business orientation scores.

The results from the t-test for the length of time that the farm has been owned by the operator and predecessors are shown in Table 15. The results indicate that a significant difference in the number of years that the farm had been in the family was found between those with a high social orientation score and those with a low social orientation score. This provides clarification of the multiple comparison test performed for these variables. Group 2 which is comprised of those respondents who exhibited a high social and low business orientation was found to live on a farm that had been in the family for a longer period of time than the two other orientation groups characterized by low social orientations.

The t-test that was performed for farm size on both high and low business orientations and high and low social orientations found a statistically significant difference between those with high business orientations and those with low business orientations. Those with high business orientation had an average of 652.2 acres and those with low business orientation had an average of 522.1 acres. The fact that a significant result was found in the t-test and not in the multiple comparison test indicates that when business and social orientations are combined into the personal orientation variable with four possible values, there are interaction effects between the variables.

As shown in Table 15, the test of the relationship between the percent of income that is derived from off-farm employment indicated that those with a high business orientation had significantly more income derived from off-farm employment than those with a low business orientation score. No significant difference between high and low social orientations was detected. No significant differences were found among the personal orientation scores for risk score.

A t-test was performed to determine any relationship between personal orientation and managerial consideration score. The mean managerial consideration scores calculated for the two types of personal orientation indicate that there is only a minimal difference in the managerial consideration score between those with a high business orientation and those with a high social orientation score. However, for both personal orientation types, those with a high level of either business or social orientation have a higher managerial orientation score than those with a low level of that orientation. As shown in Table 15, there are statistically significant differences in mean managerial consideration scores between high and low scoring respondents in both of the personal orientation categories.

When the relationship of business and social orientation scores and the other variables were studied there were a number of significant relationships found. However, further analysis indicated that there were fewer differences between business and social orientation than there were similarities. Thus, a score for personal orientation which allows for a number of combinations of business and social scores was derived.

It was determined from the analysis that farm operators with clearly defined value orientations, regardless of whether the orientation is of a business or a social nature, tend to exhibit a number of the personal and farm characteristics delineated in the first hypothesis. In addition, these farm operators demonstrate more consideration in their managerial decision-making process.

6 SUMMARY AND CONCLUSION

The initial question that motivated this study was, Why do farmers make some decisions which seemingly cannot be explained by economic analyses? The main argument of this study has been that farmers make decisions other than would be expected because they have different value orientations. It is their value orientations which lead them to view situations and alternatives from a different and unique perspective than any other farm operators. These same value orientations are those which motivate the farm operator to take on the occupation of farming in the first place despite the alternatives available. The following conclusions were reached as a result of the data analysis presented in the previous sections.

1) Farm operators with a personal orientation which consists of high social and high business scores are significantly younger than those with a high social and a low business score. Younger farm operators have more opportunities available than older operators to change careers if they are not satisfied with farming as a career. Those younger farm operators who do not place a high value on the elements of farming are likely to quit and take on an alternative career. It is possible, therefore, that the younger farm operators in the sample are farming out of choice. An older farm operator who does not value the business or social aspects of farming, is less likely to have as many employment opportunities or education skills, because of age, as the younger farmer. This farm operator is more likely to stay with farming, because there are not as many alternatives readily available.

2) Those farm operators who have a personal orientation which is strong in both business and social orientations have more industry organizational involvement than those with both low business and social orientation scores. A plausible explanation for this is that those operators who place a high level of value on the business and social aspects of farming are likely to be involved in industry related organizations which may provide useful farming information. This farm related information will assist the decision makers in making more informed decisions by reducing some uncertainty and, ultimately, work towards the survival of the farm.

3) Farm operators who exhibited a combination of high social and low business orientations tended to have been both working on their current farm and living on a farm that has been owned by the family for a longer period of time than any other personal orientation combination. This finding is supported by a difference of means test which considered the history of farming for those with high social and low social orientations.

Those farm households whose operators have a longer history of farming tend to have a high social orientation score. A possible explanation for these findings is that operators on farms that have existed for longer periods have already survived the critical period that can occur when a farm is newly established and is not yet in a situation of financial stability. The farmers with the longer history of farming are no longer as concerned with business goals as they are with social goals. They are more likely to have already achieved the financial goals that are central to a farm operator just establishing an operation. Since the financial goals have already been reached, the farm operators have more resources available to spend working towards satisfying family and societal goals.

4) Those farm operators who exhibited high levels of both business and social orientations tended to earn more in gross sales than those with low scores in both orientations. A likely explanation for this result is that since operators with both high business and high social orientations highly value both the business and the social aspects of their farm household, they are more likely to act to insure the longevity of their farms. If there is more concern with the longevity of the farm, there will be more emphasis placed on achieving higher levels of gross sales.

5) The difference of means test between high and low business orientations determined that those with a high business orientation had significantly larger farms than those with low business orientation. Farm operators to whom the goal of enterprise expansion is important would likely score higher on the business orientation scale. These operators are likely to value business goals and, as a consequence, make decisions that lead to the establishment of larger farms.

6) Those farm operators who scored high on both the business and social orientation scales tended to have a higher managerial consideration score. The group with the lowest managerial consideration score is the group who had the personal orientation of both low social and business scores.

Additional support was provided by the difference of means tests between high and low social orientations. For both orientations there are statistically significant differences in the mean managerial consideration scores. Those with a high level of either business or social orientation have a higher managerial orientation score than those with a low level of that orientation. This is an indication that the social and business goal statements in the study may not have been discrete. They may have been measuring a similar trait.

6.1 Discussion

Frequently, in decision-making research which seeks to establish the presence of goals, there is reference to two types of goals, economic and non-economic goals (Blackburn et al., 1979a). Goals that are viewed to be economic are goals such as profit maximization, having a farm business that provides a wage similar to that in any other business, and establishing a growing farm business. Family involvement in the farm, community recognition, and a healthy lifestyle are goals that are viewed as being non-economic.

The data analysis for the study provided support for the assertion that economic and non-economic, as they are frequently referred to, should not be viewed as competing goals. Respondents with high managerial consideration scores tended to have high scores in this study, on both social and business orientation scales.

An explanation for the apparent positive relationship between business and social orientations is that, although they may appear to be outwardly incongruous terms, they are measuring related elements of a broader concept of value orientations. The concept of value orientations is not a specific one. It does more than simply provide a guide for the decisions of an individual when a problem is encountered. Rather, a value orientation is something which frames how the individual perceives the world and his/her place in it. The orientation is neither specifically economic or non-economic, social or business. A value orientation is a synthesis of all these factors plus other social, psychological and economic values and ideas. The varying proportions of each of these elements is what makes the individual unique.

The results from the study indicate that if an individual exhibits a strong agreement with goal statements which are indicative of both social and business orientations, that individual will also exhibit a greater amount of consideration of managerial processes when making decisions. These farmers are interested in a broad range of the benefits from farming. They place high value on both the financial and social/psychological aspects of farming. Thus they will exert considerably more effort in their managerial decision-making process in order to ensure success.

When considering the farm decision-making process, it is imperative to consider all of the goals and values that act as motivating factors. These factors are important more than just as motivating factors, but they are so central to the individual, they play a role throughout the decision process. When considering the constraints that influence the decision maker throughout the decision process, the social, psychological and economic goals and values should not be overlooked.

Despite the fact that many of the influential goals and values have social or psychological origins, when they are considered in relation to the decision-making process, it is important to recognize that they also represent economic values. They are economic because of their influence on the economic behavior, the process of making farm decisions.

6.2 Recommendations

Any study which aims to measure a continually evolving, dynamic process, such as decision-making behavior is limited by the difficulty in quantifying a process. The current study attempted to measure as much of the decision-making process as possible by examining activities that occurred at various stages of the process. Behaviors related to information gathering, and processing were measured and analyzed. A study of this nature, which examines stages during the decisions processs, is limited, however, in the explanatory power in relation to the process in its entirety.

Future studies of the decision-making process would benefit from a combination of a detailed quantitative and qualitative analysis of the process of making decisions. To effectively study the decision-making process of farm families, a longitudinal study over a period of a number of years would be advantageous. Study over a number of years would be beneficial to evaluate the decision process of a household as it evolves and changes.

A possible explanation for the small number of significant relationships found between personal orientation and the personal and farm characteristics of respondents is the measure of personal orientation that was used. The study used only eight statements to measure business and social orientation. It is possible that a stronger and more differentiated measure of personal orientation would have been attained by using a large number of goal statements to measure each of the orientations. A recommendation for future studies is that a larger series of goal statements be used to elicit business and social orientations.

It is important for future farm decision-making studies to view management decision-making not purely as an economic activity, but rather, as a social behavior related to the occupation of farming in the environment of the individual, the family, and the community (Bennett, 1980). The constraints caused by the relative importance of each of these elements, and their interaction with the value orientation of the decision maker(s) are key factors influencing decision processes.

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