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THE IMPACT OF THE MICHIGAN FARMLAND AND OPEN SPACE PRESERVATION  
ACT OF LANDOWNER BEHAVIOR IN THE GREATER LANSING AREA

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## CHAPTER 1

### INTRODUCTION AND PROBLEM SETTING

It is generally recognized that Michigan's agricultural base is among the most diversified in the nation. Production more than fifty varieties of commodities,<sup>1</sup> the industry as a whole contributes more than \$15 billion in value added to the state's economy.<sup>2</sup> And in terms of employment, it is estimated that one out of every eight of the state's workers are engaged in agriculturally related activities.<sup>3</sup>

In recent years, however, the viability of farming as a contributor to the state's economy has been threatened by a variety of sources. According to the Michigan Department of Agriculture, the use of these lands for nonfarm developments such as shopping centers and condominiums led to a yearly loss of an estimated 20,000 acres of prime farmland between the years 1977 and 1982.<sup>4</sup> While such a conversion can be considered a natural consequences of an expanding economy, the most productive and ecologically fragile lands are often turned over first.<sup>5</sup>

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<sup>1</sup> Michigan agricultural statistics 1986, Michigan Department of Agriculture, Lansing, MI, p. 2.

<sup>2</sup> Michigan Data, 1982, National Resources Inventory, USDA, Soil Conservation Service, East Lansing, MI, p. 53.

<sup>3</sup> Planning for Zoning and Farmland Protection, Prepared by the American Farmland Trust, January, 1987, p. 5.

<sup>4</sup> Screening Committee, Governor's Conference on Agriculture, Prospects for Michigan Agriculture and gribusiness in the 1980's, October, 1983, p. 13.

<sup>5</sup> Since many Michigan cities were settled near rivers, adjacent fertile bottomlands were used for urban development.

Since the supply of these lands is finite and irreplaceable (not reconvertible to agricultural use)<sup>6</sup>, their transformation can lead to increasing pressure on lands which remain in farming. And beyond the obvious loss of food production caused by nonfarm development of USDA classified prime and unique lands, there has also been concern over the loss of scenic open space and the deterioration of wooded areas and wildlife, as well as a potential increase in surface water runoff in the areas affected.

Poorly planned development affects both the general landscape as well as the viability of farming in two additional ways. First the development of lands which were formerly farmed often effects the economic viability of operations which still exist. Farmers may experience externalities such as vandalism to their crops and equipment as a result of the influx of new residents. The incidence of complaints and lawsuits may also increase as these residents are confronted with what they consider to be unacceptable levels of noise and odors. Higher cost of added vigilance to combat these effects as well as the costs of new services such as sewers and water often make it more difficult for existing landowners to continue their operations. And the fact that potential development exists may discourage investments deemed essential to the maintenance and conservation of these operations.

The land buffer which is added by development to allow the continuation of farming can further accentuate this loss of farmland. It has been estimated that for every acre which is built on, between .46 and 1.30 acres are idled.<sup>7</sup> Lastly, haphazard development often transforms the landscape from open space to urban sprawl.

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<sup>6</sup> Theoretically, nongriculturally developed land can be converted back to farmland, but at great cost.

<sup>7</sup> Robert E. Coughlin et al. "Saving the Garden: The Preservation of Farmland and Other Environmentally Valuable Landscapes Under Pressure of Urban Development," Report to NSF (RANN), Philadelphia: Regional Science Institute, August, 1977.

On an individual level, the scenario of conflict which occurs between the landowner and an expanding metropolitan area has been well documented in studies throughout the U.S. and the area which is examined in this study. Typically, it begins when urban residents opt to relieve themselves of the crowded conditions of the city by relocating in adjacent rural areas. For this privilege, they are often willing to spend up to several thousand dollars for a parcel of land which has an agricultural value of much less. As a consequence, the values of existing owners' lands are assessed at their potential rather than current use.

As the area becomes more intensively settled, property taxes typically rise as greater revenues are required for the provision of services such as sewers and water, schools, and police and fire protection. Property taxes then increase at a faster rate in these areas than other, more remote agricultural regions.

What happens next is that the existing landowners are caught in a "tax squeeze"-- their income from farming and the use of their land remain the same, but the taxes which they pay on their property often increase greatly. The costs which result from such a tax burden may be so great that it becomes impossible to earn a profit from the land itself. Consequently, the landowner may be forced to sell his land to increase his liquidity, contributing further to the 'go with of urban sprawl.

In response to farmer and public concern over the related problems of farmland loss and high property taxes, the state of Michigan in 1974 enacted Public Act 116, the Farmland and Open Space Preservation Act.<sup>8</sup> Designed primarily to diminish the loss of prime farmland that occurs in conjunction with the growth of urban sprawl, one of the act's indirect objectives was to allow

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<sup>8</sup> Michigan Public Act No. 116, 1974.



effected farmers the ability to continue their operations by eliminating the aforementioned "tax squeeze." By reducing the property tax burden and the cost of holding land, it was hoped that the act would enable enrollees to refuse purchase offers made by developers. The specific means to achieve these objectives has been the voluntary transfer of development rights for such lands from the landowner to the state of Michigan for a minimum period of 10 years.

A transferal of these rights benefits the enrollee in two primary ways. First, he is exempt from all of the aforementioned nonfarm assessments for items such as sewers, water, and roads. Second, while he pays the full amount of his property taxes on his land, buildings and other structures as before, he is credited for property taxes which exceed seven percent of his income (from all sources). Upon termination, the income tax credits which are obtained from the last seven years of the contract are used as a lien against the property and any special assessments which have been made during the period of contract are charged for the use of these services. Finally, for lands which are contracted according to the open space provisions of the act, property taxes are assessed at current use rather than existing market value.

To qualify, designated "farmland" must be primarily undeveloped and actively farmed. For this, any enrolled land must be at least 50% cultivated and/or used as pasture. Such holdings must be "unimproved" except for dwellings, farm residences, roads, and all other structures which are intended for agricultural use. Beyond these, any one of the following may qualify:

- a) a farm of at least 40 or more acres.
- b) a farm of at least five acres but less than 40 acres devoted primarily to agricultural use which has produced from agriculture at least \$200 per year per acre of tillable land.
- c) a specialty farm in one ownership which has produced a gross annual income from agricultural use of \$2000 or more.<sup>9</sup>

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<sup>9</sup> Michigan Public Act No. 116, 1974.

Response to the program has been good. Over 4 million acres have been enrolled as of 1 January 1986. And some of the highest participation has taken place in counties which have major metropolitan areas, such as Ingham, Kent, and Saginaw. What's more, the program has had definite success in counties which have suffered large decreases in farmland from the period 1969-82.<sup>10</sup> Still, two concerns about the effectiveness of the program prevail. First, much of the land immediately adjacent to these metropolitan areas remains nonenrolled. Second, the costs of the program are ultimately paid for by the balance of taxpayers throughout the state.

The purpose of this study is to determine the impact which the program has had on individual land use decisionmaking in a growing metropolitan area- greater Lansing. Toward this end, it documents the response of these landowners, enrollees and nonenrollees, to the objectives of the program. Behavior based on factors not related to program incentives such as the age of the landowner, location, and development expectations is also considered. So the effectiveness of the program in encouraging delays in nonfarm development among individual landowners is closely examined. And by considering the salient factors which typically determine landowner behavior, the study will attempt to address the following questions:

- \* Which qualities (organization, purpose, motivation, type and size of operation, and age) are profiled by program enrollment?
- \* What relationship exists between program enrollment and sales of land?
- \* What relationship exists between program enrollment and purchases of land?

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<sup>10</sup> Lynn R. Harvey. "Property Taxes: Assessments, Rates, Revenues and Relief Programs Including P.A. 116," Department of Agricultural Economics Staff Paper, Michigan State University, April, 1987.

- \* What impact has the program had on new capital investments and improvements such as machinery and equipment?
- \* What impact has the program had on one's ability to continue farming?
- \* What are the primary motivations of enrollment in the program?
- \* What are the primary reasons for nonenrollment in the program?
- \* What is the extent of enrollee commitment to contract objectives?
- \* Is the credit which is offered sufficient to achieve the desired results of the Act?

The subsequent chapters lay the groundwork for an analysis of these issues as follows. Chapter two reviews empirical studies that identify and measure the extent to which factors (pecuniary and nonpecuniary) such as age, type and length of ownership, and the distance from a major metropolitan area affect the suburban land market. Specifically relevant are those factors which help to predict whether or not these landowners will retain or sell land.

Chapter three develops a model of the landowner as an investor. This framework is used to construct a more general model to formulate hypotheses regarding behavior among enrollees and nonenrollees. Both pecuniary and nonpecuniary factors such as commitment to farming and distance to urban areas are incorporated into the model to facilitate these predictions.

Chapter four incorporates the effect of enrollment on these factors and on land-use as a whole. In Chapters five and six, survey results are used to empirically test hypotheses made in previous chapters concerning behavioral factors and their effect on program response and usefulness.

Conclusions and policy implications follow in Chapter seven.

## CHAPTER 2

### A CONCEPTUAL FRAMEWORK FOR UNDERSTANDING LANDOWNER BEHAVIOR AT THE URBAN FRINGE

Due to the special nature of land and the suburban land market, relatively little is known about the behavior of its major participants and the factors which influence them to buy, sell, and/or hold land. While some seminal studies such as Schmid (1967), and Clawson (1962), have been made about the dynamics of these markets in specific areas, it is generally conceded that they are applicable only to their region.

Recent concern about the problems which accompany rapid urban expansion, however, has prompted an examination of these factors. The adoption of direct policies such as planning and zoning to remedy these problems will require an understanding of the behavior of actual participants as well. Unfortunately, no known studies have been made on these factors in the Greater Lansing Area. Nevertheless, the following literature search revealed a recurrence of certain salient behavioral characteristics. And as will be shown, the majority of these can be divided into two general categories: those related to the landowner and those related to the property itself.

#### 2.1 THE NATURE OF THE MARKET FOR LAND

An analysis of the "market" for a given good often begins with a description of the conditions under which perfect competition is likely to exist. An analysis of the market for land then should start with a consideration of the following characteristics:

1. Many buyers and sellers.
2. Homogeneity and divisibility of the product.
3. Perfect information<sup>11</sup>

The unique qualities of land, however, requires a relaxation of these assumptions. First, land is not mobile.<sup>12</sup> A buyer from a distant area cannot purchase a piece of land and relocate it in another area.<sup>13</sup> For this, bidders for a given parcel will typically reside in the same immediate area. Likewise, sellers of land cannot transfer their land to an area where greater potential demand exists. Its fixed nature will restrict the number of possible buyers and sellers. For owners, this quality often contributes to a strong emotional attachment to the land.

Unlike other goods, land is not homogeneous. Within a given area, land will often differ greatly among neighboring parcels. Fertility, slope, type of vegetation, and access are among the fundamental characteristics which differentiate lands in a particular area. And since greater yields can be obtained from most types of land with more intensive use of inputs and practices, fertilizer, insecticides, and/or irrigation can be considered substitute goods for land itself. Finally (as will be emphasized later), the location of a parcel in relation to the immediate area's existing land uses will be of crucial importance to its value.

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<sup>11</sup> Kenneth Boulding, Microeconomics, New York: Harper & Row, 1966, p. 604-9.

<sup>12</sup> Alan Randall, Resource Economics, New York: Wiley & Sons, 1987, p. 157.

<sup>13</sup> While the physical transferability of land itself is impossible, the subdivision of its ownership through such arrangements as leasing, sharecropping, renting, and easement may enhance the mobility of one's rights to land.

Its availability also makes it unique. Unlike the market for other goods, potential buyers of land must be well informed of the above qualities as well as the existence of regulations such as zoning, restrictive ordinances (such as Michigan's "Right to Farm Law"), and the overall conditions of the local economy. Familiarity will usually guarantee the localization of the market for land, especially rural, and the assumption of perfect information will also require that buyers and sellers be in close contact. Consequently, they must have accurate knowledge of prevailing prices in the market.

Furthermore, while land is often divisible (as evidenced by the number of ten acre splits in the study area), it is not usually done with ease. And as emphasized by Healy,<sup>14</sup> the act of division often changes the nature of the good itself.

## 2.2 REVIEW OF THE LITERATURE

### 2.2.1 Studies Concerning Behavior Related to Property and Personal Characteristics<sup>15</sup>

Healy and Short (1981), in their analysis of trends and policies in the market for rural land in the U.S., categorize the supply of land in any given market as a function of the local "owners' demographic characteristics and their expectations". While expectations of the value of such land will be related to demand for it in the area, they are also said to be determined by the owner's personal valuation of the land and the resources it provides. The total of these values are reflected in a given "reservation demand".

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<sup>14</sup> Robert G. Healy and James L. Short, the Market for Rural Land: Trends, Issues, and Policies, Washington, D.C.: The Conservation Foundation, 1981, p. 87-88.

<sup>15</sup> Ibid, p. 102.

As above, the unique nature of land- specifically its transferability, will assure that this "reservation demand" is different from the demand for other goods. While the money received to purchase investments such as securities or metals can be used to buy a good which is reasonably substitutable, the sale of land by a farmer usually results not only in a change of job, but also a change in lifestyle. Thus, a farmer who received an offer to sell his land can acquiesce only if he can find a similar place to live and an occupation to his liking. For this the behavior of agricultural landowners toward selling their land, especially those at a particular stage in their lifecycle, can be expected to be different from those who hold land solely for speculation or investment.

Similarly, factors such as demographics and lifecycles will also have a bearing on the market for land. In a study of sales in Virginia cited by the authors, health and age were found to be the two most important reasons given for selling land; price offered, strangely enough, was listed third. Landowners' deaths were also seen as important components of the amount of land offered for sale in any given market, as the presence of excessive estate taxes to the heirs of such land often approached or even exceeded its sale price.

The authors conclude that both the uncertainty of local conditions and the reluctance of many landowners to radically alter their current way of life cause the behavioral response to changing local demands to be somewhat "sluggish".

In the hope of developing a mode which would predict "the likelihood that a parcel in nonurban use on the urban fringe would be sold during the next few years", Kaiser et al. (1968)<sup>16</sup> empirically tested a number of landowner and

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<sup>16</sup> Edward J. Kaiser, R. W. Massie, Shirley F. Weiss, and John E. Smith, "Predicting the Behavior of Predevelopment Landowners on the Urban Fringe," Journal of Urban Economics, September, 1968, p. 328-33.

property characteristics among approximately 400 landowners in the fringe areas of Greensboro and Winston-Salem, North Carolina. A multivariate discriminate analysis was used to determine which of these characteristics (independent variables) best explained the landowners decision to either hold or sell the land (dependent variable).

For this, two main elements were recognized to influence such a decision: "the characteristics describing the landowner that determine his reaction to pressures for sale; and the property characteristics that affect not only the kind and degree of pressure to sell but also the ability of the land to supply monetary or psychic income to the landowner." Among these landowner characteristics, the length of time one held land and one's actual residence on the land were found to be the most statistically significant. Likewise, one's occupational status (retired or not retired) as well as the type of one's ownership (single or joint) were also highly associated with the tendency to sell. Among those least likely to sell were those living on the land itself, those not retired, those owning the land themselves, and those who had held their land longer than 10 but less than 40 years. And among those most likely to sell were absentee owners, those retired, those owning their land jointly, and lastly those who either had held their land for very short or very long periods of time.

Among the following property characteristics- the proportion of land already in urban use surrounding the parcel; the distance to a highly valued corner of a nearby central business district; local zoning protection; proportion of marginal land not suitable for development due to physical characteristics; the size of the parcel; and finally the assessed value of the parcel, only the degree of adjacent urban development was seen to be significantly related to sales. As a result, a parcel was more likely to be sold within ten years if there was a certain degree of urban development nearby. All other characteristics were found to be insignificant.



In general the procedure successfully predicted the final outcome (held or sold) in 61.5 percent of the parcels examined. Nonetheless the authors are careful to point out that the landowner characteristics "had a tendency to be less important in their effect as one either moves toward the center from a ring around the edge of the urban area or as one moves outward from this ring." Also, since the accuracy of such predictions varied among the cities sampled, the authors suggest that similar models be adjusted to the planning area under review.

Among the insightful empirical work on landowner behavior on the urban fringe by the same group- the Center for Urban and Regional Studies, University of North Carolina at Chapel Hill, was made by Smith ( 1967).<sup>17</sup> As in the study above, this author attempted to categorize the behavior of landowners in the fringe area of Greensboro, North Carolina. Using an expanded present value model which incorporates both pecuniary and nonpecuniary factors, Smith attempted to predict which of these landowners were most likely to continue existing practices and which would be most likely to sell their land. As a result of this model, the following landowner characteristics were hypothesized to have the greatest effect on such decisionmaking: income, occupational interest in real estate, liquidity, net worth, age, health status, work status, major purpose for holding land, residency status, length of land holding, landholding experience, and finally landselling experience.

In a similar survey, Brown, Phillips, and Roberts (1981)<sup>18</sup> found that type of ownership was the most significant indicator of future land use in the urban fringe

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<sup>17</sup> John E. Smith, Toward a Theory of Landowner Behavior on the Urban Periphery, Master's Thesis, University of North Carolina at Chapel Hill, 1967.

<sup>18</sup> H. James Brown, Robin Swaim Phillips, Neal Roberts, "Land Markets at the Urban Fringe", AIP Journal, April, 1981, p. 131-144.

among a number of American and Canadian cities. Since speculation causes changes in both the character and type of ownership in such lands long before actual development takes place, the authors note that other factors like the age of the owner and its proximity to urban centers should be considered of minor importance.

Focusing on the fringe areas of Atlanta, Boston, Calgary, Sacramento, and Toronto, the study revealed that while most parcels in these areas were relatively small, much of the total land considered was found in very large tracts. Indeed in the U. S. cities surveyed, the 4 percent of the parcels larger than 100 acres accounted for more than 40 percent of the total land in the urban fringe. Similarly, with respect to ownership, corporations and partnerships, while holding a small percentage of the number of parcels, controlled a greater proportion of actual land.

Turnover of land in the urban periphery was common. Sixty percent of the landowners surveyed had acquired their land since 1960. Parcels which had been turned over since 1970, however, were smaller than those which had not, signalling a greater tendency to subdivide these larger lands into residential plots. Lastly, although figures for the Canadian cities tend to be smaller on average, in the fringe around U. S. cities, less than half of the total land, and only 18 percent of the land parcels were farmed.

What is most revealing is the breakdown of landowners and their motivation for holding land. First, while 90 percent of owners were classified as families, only 28 percent of them in the U. S. actually cultivated their land. Similarly, of those who identified farming as their principal occupation, only 8 percent owned parcels, accounting for only 26 percent of the land area in the four cities. The rest were listed as employed in business, real estate or retired.

For those listed in the second category - investors, "no current use" was the predominant response. Among the primary characteristics of this set of respondents, the following are significant: first, in contrast to users, their median income was nearly \$50,000. Second, unlike those holding land for personal use, investors tended to have other assets. Lastly, investors were found to have held land for a shorter period of time than users--typically less than twenty years.

Finally, while developers were found to hold the least amount of land and the fewest number of parcels, they are the most active in the fringe land market, turning over their land an average of every eight years.

A breakdown of these types of landowners into those owning property in areas which are experiencing or are expecting to experience intense, moderate, and light development pressures draws more light on their behavior. In general, it was found that investors and developers own a much larger percentage of land in areas which are experiencing intense development pressures than those of moderate and/or light pressure. In four of the American cities surveyed, investors held 31% of fringe lands under intense development pressures, while developers owned 12% by contrast, in those areas where pressures were moderate or weak, more than 80% of the land area was owned for personal or business use.

Similarly, as these pressures increase, patterns of land use tend to change as well. Indeed, it was found that in areas experiencing intense development pressures, less land was devoted to farming. Not surprisingly, in fringe acres where development opportunities are moderate or weak, farmers were found to own approximately one-third of the land.

As development patterns strengthen in the fringe, the size of land holding tend to reflect these changes. In areas experiencing moderate or weak development pressures, the average parcel was typically larger than 200 acres. In those areas where development is imminent however, more than 40 percent of the

land was divided into plots of less than ten acres (It should be pointed out that such a pattern is quite common throughout the area which is studied -- Eaton, Ingham and Clinton Counties.)

Landowners' future intentions tended to reflect the intensity of local development as well. In regions where development is expected within ten years, more than half of the landowners surveyed anticipated selling their holdings in the near future. This pattern is particularly evident among those recently acquiring land. Of those surveyed, only 41.5% of recent buyers located in areas of strong development expect to keep their land within five years. Thirty-seven percent plan to sell land before then, and 22 percent plan to develop their land themselves. Lastly, an amazing 37 percent were willing to sell their land immediately.

#### 2.2.2 Studies Concerning Behavior Related to Expectations

Dunford, et al. (1985),<sup>19</sup> uses a different approach when modeling landowner behavior at the urban fringe. Instead of determining which salient characteristics explain one's behavior with respect to selling or holding land, the authors take a step backward and attempt to classify the external and physical characteristics of the land and even the buyer itself which are important in shaping the owner's perception of the value of the land. The perceived value of such land will then go a long way toward explaining future behavior. Using this approach, one's reservation price and, thus their decision to sell land will be based on the expectation of future forces such as rates of inflation, mortgage interest

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<sup>19</sup> Richard W. Dunford, Carole E. Marti, Ronald C. Mittlehammer, "A Case Study of Rural Land Prices at the Urban Fringe Including Buyer Expectations," Land Economics, February, 1985, p. 10-16.

rates, the level of price supports offered, and above all their personal situation. Such personal expectations, they claim, are often strongly influenced by the characteristics of the seller; thus they assume that older buyers will be more willing to sell their land than younger ones, *ceteris paribus*.

Using a sample of landowners in Clark County, Washington (adjacent to Part land, Oregon), participants were asked about land characteristics, their socioeconomic characteristics, as well as their expectations of future economic conditions. The impact of these characteristics were then ranked in terms of their success in explaining the variation in purchase (and hence owner's reservation) prices for parcels in question. Among these, the following were significant at the .01 level: the month of purchase during the calendar year, the buyer's perception of "the present intensity of development in the neighborhood surrounding the parcel," the probability "that a parcel would receive approval for septic tank installation (as determined by an SCS soil scientist)," the size of the parcel in acres, and finally the buyer's expectation that his/her parcel would be more intensely developed in the next five years.

At the .10 level, whether or not the parcel was located within the Urban Sewer Service Area in the county, whether it had some road frontage, whether "the buyer acquired the parcel for either agricultural or residential uses," and lastly whether the buyer was part of a corporation or partnership were the significant binary variables. Otherwise, the following variables were significant: the distance in miles from the parcel to the nearest interstate highway ramp, the distance in miles from the parcel to the nearest of three small towns, the approximate number of parcels the buyer bought or sold in the past five years (grouped into four categories), and lastly the buyer's opinion "concerning the average annual general inflation rate over the next five years (grouped into four categories)".

## 2.3 CONCLUSIONS

In general then, the factors which appear to be significant in determining one's decision to sell or hold land can be divided into three general categories: those relating to demographic characteristics of the landowner; those relating to the economic viability of the property itself; and those related to external circumstances such as expectations, the demand for land and location. Within all of these the nontransferability of the land and the commitment which results are salient. For the first, the following characteristics can be considered to be the most important:

1. age of the owner
2. number of acres owned
3. organization (family, partnership, or corporation) of the operation
4. motivation for acquiring land
5. purpose for owning land
6. length of ownership
7. residency on the land itself

And for factors related to the economic viability of the property, characteristics such as soil fertility, and prevailing climate which affect the profitability of the land will obviously be of great importance. For external factors, characteristics such as expectations, location, and proximity to an expanding urban area are expected to be critical. These characteristics can now be applied to the behavioral model which follows.

## CHAPTER 3

### A MODEL OF THE LANDOWNER AS AN INVESTOR

The recognition of the factors cited above facilitates the construction of a model that can be used to predict landowner behavior, specifically those actions relating to holding or selling property. From such a model, hypotheses can be generated and applied to decisions regarding enrollment in the Open Space and Preservation Act. Later, these hypotheses can be tested through the empirical study undertaken in Chapter Five.

As stated at the conclusion of the preceding chapter, the literature review indicates that three primary factors will determine the behavior of landowners in the urban fringe: 1) those relating to the economic viability of the property itself; 2) those relating to external circumstances such as the demand for land and its location; and 3) those relating to demographic characteristics of the landowner. Implicit in the analysis of each of these factors are the fundamental physical characteristics of land itself as well as the factors outlined at the outset concerning the market for land. Before considering each of these factors in kind, a description of the evolution of the theory of land rent is warranted.

#### 3.1 EVOLUTION OF THE THEORY OF LAND RENT

Early treatises on the viability of land typically focused on the notion of economic rent. The writings of Ricardo reflected this trend, using the concept of economic rent to describe the returns to land and its improvements. For agricultural land specifically, rents were said to be related to population growth, since increases in the demand for land for food production made it necessary for a society to periodically bring marginal lands into use. As stated by Ricardo himself:

"If all land had the same properties, if it were unlimited in quantity, and uniform in quality, no charge could be made for its use, unless where it possessed peculiar advantages of situation. It is only, then, because land is not unlimited in quantity and uniform in quality, and because in the progress of population, land of an inferior quality, or less advantageously situated, is called into cultivation, that rent is ever paid for the use of it. When, in the progress of society, land of the second degree is taken into cultivation, rent immediately commences on that of the first quality, and the amount of that rent will depend on the difference in the quality of these two portions of land<sup>20</sup>. Thus differences in the quality of particular plots of land was considered to be the primary factor in determining differences in economic rents."

Von Thunen<sup>21</sup> expanded this notion of rent, emphasizing factors such as location in its determination. For agricultural land specifically, the advantages of location were seen to be related to the distance to the market for goods which were produced. Thus, given two plots of similar quality for the production of food for a specific market, the one located nearest to the central market - i.e., a large city, was likely to have a rent advantage over the more distant one, as transportation costs are relatively lower. Technological developments, however, have altered the applicability of this theory, since modern transport and preservation techniques for agricultural products have significantly diminished the importance of distance. Nevertheless, the costs associated with modern modes of transportation will certainly affect the rent-paying capacity of certain lands.

Alonso later enlarged the theory of location to include the businessman and residential demanders of land<sup>22</sup>. Like the farmer, location for the businessman was seen to be related to the level of profits. Rents in turn were recognized as a

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<sup>20</sup> David Ricardo, The Principles of Political Economy and Taxation, London: 1817: Everyman's edition, London: J.M. Dent & Sons, Ltd, 1911, p. 34.

<sup>21</sup> Johan Von Thunen, Der Isolierte Staat, Hamburg, 1826.

<sup>22</sup> William Alonso, Location and Land Use, Cambridge: Harvard University Press, 1970, p. 40-44.



reflection of the volume of output and operating costs. For residential demanders of land, however, satisfaction, rather than profitability was seen as the major criterion of location. Therefore, given similar levels of income and tastes, consumers of such lands will seek to balance the cost and bother of commuting against the benefits of cheaper land and open space.

Lastly, more recent theories have included factors such as operator inputs and land quality in the determination of rents.<sup>23</sup> Their impact on land rents is exemplified through the inclusion of management techniques, capital improvements, neighborhood amenities such as police protection, sewers and streets, as well as institutional factors such as access to educational facilities. The overall impact of these qualities as well as soil fertility and location are now combined to measure the income producing potential of various sites. For this, the concept of "use capacity" is now recognized as the primary determinant of land rent. In general it can be assumed that those areas with the highest use capacity will typically earn the most rent.

### **3.2 PHYSICAL AND BEHAVIORAL FACTORS RELATED TO ECONOMIC VIABILITY**

The concept of use capacity provides a useful framework for predicting the behavior of landowners at the periphery of urban areas. For this purpose, lands in the urban periphery, such as farmlands, can be thought of as factors of production which have limitless productive lives. Other lands, such as those used for housing or industrial purposes may have more definite economic lives but their use can be extended over long periods. Thus, both of these lands can be assumed to produce a typical flow of land rents.

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<sup>23</sup> Raleigh Barlowe, Land Resource Economics, Englewood Cliffs, N.J.: Prentice Hall, 1972, p. 168-9.

For this, Robert's description of value (1980), is appropriate: "Land value is derived from the value of the product and not vice versa. Agricultural land derives its value from the value of the products that can be produced on the land."<sup>24</sup> Consequently, landowner behavior related to the economic viability of a holding assumes that actions are based on the maximization of the discounted present value of the flow of these land rents.<sup>25</sup> Behavior with respect to land then, specifically farmland, will reflect the expected income which can be derived from current use.

As mentioned at the outset, however, not all behavior can be strictly categorized as a maximization of present and future income from the current form of use practiced by the landowner. Some of these decisions can be based explicitly on the hope of realizing future capital gains from the land in an alternative use. Such considerations will be particularly important in areas which are experiencing increased property values as a result of expanding urban uses. In this case, landowner behavior should reflect the maximization of both the actual as well as the potential value of the land as needs fluctuate in the community. As affirmed by Roberts:

Urban land use derives its value from the products that urban uses can bring. Since agricultural productivity is typically much lower than urban productivity, agricultural land is typically less valuable than urban land. If there is an increased demand for urban land, some rural land can be converted to urban use. Between the areas that are agricultural and have no possible potential for urban use and those that are already in urban use, areas exist where investors will be willing to pay a price greater than the current agricultural use value but less than the value for urban uses. This areas is located at the periphery of towns and cities.<sup>26</sup>

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<sup>24</sup> Neal A. Roberts, "The Big Giveaway Called Differential Assessment," in Property Tax Preferences for Agricultural Land, New York: Universe Books, 1980, p. 3.

<sup>25</sup> This notion can be expressed in the formula:  $V = a/i$   
where V=present value of the holding  
a = annual net return from the land  
i = discount rate

<sup>26</sup> Roberts, op. cit., p. 3.

Far from the distinct dichotomy where land is held for the satisfaction which is derived from either agricultural or urban use, a picture now emerges whereby the demand, and hence ownership of land, are a result of a variety of present and future uses. In such "between areas", theory suggests that urbanization results in a gradual shifting of land out of agriculture, forestry, and other intensive uses to those which can be best categorized as "extensive". Such uses, like unmanaged woodlots, and farmland which is idled for various types of economic and recreational uses, are common and occur naturally as these lands "ripen" for future urban use.

Decreased income which results from such "deintensification" of use will not, however, lead to a decrease in the value of the property itself. Indeed, as urbanization in the area intensifies, the property's value may increase as well, even if the land itself is completely idle. For this reason, all alternative uses which may lead to changes in the value of the property must be included in a model which attempts to predict future landowner decisionmaking.

### 3.2.1 Economic Considerations

Before constructing the model, certain economic assumptions must be made about behavior. First, it is assumed that the landowner is economically rational. Consequently, his present and future ownership behavior will be influenced by both pecuniary and nonpecuniary considerations, and all his actions will be predicated toward maximizing the satisfaction which results from owning land. The demographic characteristics of the landowner will reflect these actions. For some landowners, it is obvious that landowner behavior can be exemplified by the maximization of income from both current uses such as farming or expected uses such as urban development. For others, the pleasures of farming, land ownership, and community responsibility associated with the preservation of open space will overshadow the satisfaction which is derived from earning income from the land.

Lastly, some landowners such as those located in the area of study - Delta Township in Eaton County, are highly committed to remaining in farming. At the same time they are cognizant of the high value of their land. For this, they are willing to make the best of the situation and maximize their utility both ways until they receive an offer for their land which is suitable. Thus their satisfaction is derived from a combination of both pecuniary and nonpecuniary motivations.

Satisfaction which accrues to the landowner of the first type can be quantifiable in the marketplace through profits. So behavior of this sort can be said to be related primarily to pecuniary factors. Actions associated with the satisfaction of ownership or a sense of community responsibility for the preservation of land, however, have no quantifiability in the market; and can be considered nonpecuniary motivations. The analysis which follows will deal first with those related to pecuniary factors.

### 3.2.2. The Investment Model

For the purposes of this study then, the theory of economic rationality allows one to assume that landowner decisionmaking in the urban fringe will be a function of one's notion of the present value of his land. Its value in its current form of use can then be conceptualized as the flow of expected income less expenses, discounted back to the present as follows:

$$PV = \frac{a_1 - e_1}{(1 + r)} + \frac{a_2 - e_2}{(1 + r)^2} + \dots + \frac{a_n - e_n}{(1 + r)^n}$$

where: PV = present value of the landholding  
a = annual net income from the land in year t  
e = annual expense on the land in year t  
r = the opportunity cost of capital  
n = the number of years.

Since it is unreasonable to assume that both income and expenses will continue for an indefinite period, and since it is anticipated that certain landowners will calculate their present value on the possibility of selling their property in the future, the formula can be modified to account for the expected value based on the sale of the land in an alternative use after a given number of

years:

$$PV = \sum_{t=1}^n \frac{a_t - e_t}{(1 + r)^t} + \frac{EV}{(1 + r)^n}$$

where: EV = expected value or market price of the landholding in the year of sale

All other variables are defined as above.

And when calculating the present value of his holdings, theory suggests that the landowner will apply the following decision rule for choosing the optimum investment: Sell the land when the present value falls below the present market price of the land, or continue to hold it as long as the present value exceeds its current market price.

For example, suppose that a landowner wants to know whether his optimum investment decision will require him to continue to hold on to his land or sell it. Assuming that the present market value of his property is \$50,000, and its expected value in ten years will be \$50,000; the annual income less expenses is \$5,000 each year; and the opportunity cost of his capital is five percent. For this, the investment model reduces to the following formula:

$$PV = \sum_{t=1}^n \frac{a_t - e_t}{(1 + r)^t} + \frac{EV}{(1 + r)^n}$$

Using the annuity method for an interest rate of five percent, the landowner calculates the present value of his property by substituting the above values in the formula as follows:

$$\begin{aligned} PV &= 10 \times \frac{5,000}{.6139} + \frac{50,000}{(1.05)^{10}} \\ &= \$112,140 \end{aligned}$$

Next, the landowner compares this calculated present value with the current market price of his land, and applies the decision rule. Using the above figures, since the present value greatly exceeds the current market price, economic rationality would suggest that the landowner hold on to his land.

Lastly, for the purpose of this study, two further assumptions must be made in conjunction with these equations. First, all landowners are assumed to have the same opportunity costs of capital. Second, it is here assumed that they all have the same costs for the transfer of their investment.

In general then, the investment model which has been set forth holds that the economic viability of a given property will be related to its value in its present or alternative use capacity. The factors which were outlined in the previous chapter can now be applied to this model to predict whether a landowner will hold on to their land or sell it.

### 3.2.3. Behavioral Characteristics Related to Economic Viability

With respect to landowner behavior, certain predictions can be made regarding the economic viability of a particular parcel. First, behavior is expected to be related to the combined household income of the landowner. Since property taxes can be deducted from income taxes, landowners with lower incomes will have higher effective property taxes and, thus, lower present values. For this, it can be hypothesized that landowners with lower household incomes will be more likely to sell land than landowners with higher household incomes.

Since liquidity represents the economic viability of a property, landowner behavior may reflect the extent of this factor. For this, landowners who are less

liquid<sup>27</sup> are more likely to sell land than landowners who are more liquid. Since one's evaluation of the present value of land will include risk, illiquidity will necessitate a discounting of one's present value. And since land is considered to be a highly illiquid asset, heavy losses may result from its forced sale. For this, operations which are susceptible to illiquidity will be more likely to sell land.

#### 3.2.4. Behavior Related to External Factors

External factors such as demand for land are expected to have an effect on the behavior of landowners as well. In general, under conditions of high demand, the potential use capacity of landholdings in the area of demand will increase. Consequently, both the present value and reservation bid price of one's holdings will increase as well. Using the decision rule, if the market price of land increases faster than one's present value, increases in land sales can be anticipated. Typically, that land which is most highly sought after is located in areas adjacent to high development.

Beyond existing demands for land in the area, a number of other (predominantly urban) factors may promote the sale of a property. Nonfarm development of these adjacent lands will often effect the economic viability of operations which still exist. Farmers may experience externalities such as vandalism to their crops and equipment as a result of the influx of new residents. Also, a rise in the incidence of complaints and lawsuits may increase the landowner's expenses as incoming residents are confronted with what they consider to be unacceptable levels of noise and odors. These costs, the higher costs of added vigilance to combat these effects, as well as the costs of new services such as sewers and water may make it more difficult for existing

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<sup>27</sup> Liquidity can be defined here as the ability of the landowner to sell his properties at their market value within a short period of time.

landowners to continue their operations. Consequently, net income from farming tends to decrease, and pressures to sell land become greater as the present value of the land decreases.

### 3.3 BEHAVIOR RELATED TO DEMOGRAPHIC FACTORS

As noted previously, the basic act of ownership of farmland depends on a number of different factors -- both pecuniary and nonpecuniary. From this it was held that demographic characteristics will reflect these factors. Thus, while some of these factors may increase one's sensitivity to the costs of holding land, others may be ignored. As summarized by Hady and Sibold:

Some farmers, for example, like farming better than anything else they might do. They would not even quit if they could make more money by selling out and taking a job in town. Other farmers are in the business because they like the life, but they would be perfectly willing to sell and take another job if it seemed likely to produce more income.<sup>28</sup>

The factor which distinguishes these two types of landowners is lifecycle. Thus, even if the provisions of P. A. 116 increase the economic viability of one's operations, other factors may determine whether or not it will be held in its current use or sold for development purposes (a full treatment of these will be made in the following chapter). Indeed, for the landowner who has farmed the majority of his life, the trauma associated with quitting may outweigh any monetary benefit which he would obtain by selling his property.

Before applying some of the demographic assumptions of the previous chapter, it is also important to note that the nature of land itself will often have a bearing on behavior in the real estate market as well. The nonhomogeneous and nontransferable nature of land as a good will insure that the actions of its buyers

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<sup>28</sup> Thomas F. Hady and Ann G. Sibold, "State Programs for the Differential Assessment of Farm and Open Space Land," Ag. Econ Report 256, Washington: U.S.D.A., 1971, p. 10.



and sellers will be based on factors which are not solely related to economic maximization. For this, the introduction of nonpecuniary factors in the investment model is necessary.

With this in mind, the ownership of land is assumed to be related to factors such as recreation, residence, the death of a relative, love of farming and open space, community responsibility, as well as pecuniary or investment purposes. Sales of land may be related to similar considerations. Circumstances such as retirement, and the liquidation of a longstanding investment may promote the sale of one's land to the same extent as a decrease in its present economic value and/or an increase in local land prices.

Nonpecuniary motivations can be incorporated into the model as follows:

$$PV = \sum_{t=1}^n \frac{(a_t^P + a_t^{NP}) - (e_t^P + e_t^{NP})}{(1+r)^t} + \frac{EV - (e_1^P + e_1^{NP}) - (e_2^P + e_2^{NP})}{(1+r)^n}$$

where all are defined as above. Symbols with the superscript np refer to the nonpecuniary components of these variables. Lastly, before considering these factors individually, it can generally be assumed that landowners without strong nonpecuniary motives for holding land will derive lower utilities and present values from ownership, and as a result, will be more likely to sell.

The first of these factors -- age, will affect the model as above. Strong emotional or sentimental attachment to the land will tend to increase one's "psychic income." Consequently, such a landowner may become more dependent on this type of "income" as the attachment grows over time.

The second factor to be tested - purpose, suggests that landowners who own land for investment or lease to others will be more likely to sell than those who farm their land or have some other purpose. The former group represents the special case of the landowner who is "holding out", waiting for the optimum time

to sell their land. While this type may not even be obtaining normal rates of return on their land, speculative interests predominate their landholding decisionmaking. Applying the present value model to this group, it is clear that only pecuniary factors are relevant. All things equal, those who are able to derive some nonpecuniary utility from their landholding will increase their present value and, as a result, be less likely to sell.

One's motivation for holding land should also affect their present value. For this, owners who have a nonpecuniary motive for holding land, such as the desire to reside in the country or preserve open space through farming, will be less inclined to sell their land. This is so because they may experience a certain "psychic cost" when doing so. The trauma of leaving one's land and the loss of material goods such as machinery, livestock, and farm buildings may also be associated with such a sale. Clearly, landowners of this type-particularly full-time farmers, will derive higher present values as a result of these nonpecuniary factors.

Lastly, behavior which is based on noneconomic factors can also be related to the length of one's ownership. Landowners who have owned their land for a shorter period of time are more likely to sell their land than longstanding owners for the same reasons as above. Psychic and/or emotional attachment to the land is often related to the amount of time which one has owned it. So as above, it can be hypothesized that those who have owned their land for longer periods of time will have higher present values. While not tested, a landowner's actual residency on a particular parcel of land will often have an effect on his behavior as well.

### **3.4 BEHAVIOR RELATED TO EXPECTATIONS**

As above, if perfect information about the value of one's land is assumed for all landowners, it follows that those expecting development in the near future will be less likely to sell their land than those who have more distant development

expectations, since their present values and bid prices will be lower. However, before making such an assumption unconditionally, the factors which shape these expectations should be outlined.

It is held that the uniqueness of the market for land will play an important role in the formulation of expectations. First, the absence of large numbers of buyers and sellers in close contact may result in widely varying estimates of present values. Because of this, farmers at the fringe do not normally actively pursue the sale of their land through the same channels as urban landholders. Instead, often they periodically learn about, or are approached by speculators for opportunities to do so. As a result, their actions towards realizing the full value of their land are influenced by speculation as well as by both uncertainty and transactions costs. (Indeed, speculators earn their living trying to anticipate what the market will do. Thus, if there were no uncertainty in the market, there wouldn't be any speculators.)

"Booms" in real estate markets in given areas are common, and have been well documented in recent years. Often they rely upon mass uncertainty for their effectiveness. So the expectations of neighboring landowners will often make a great difference in the formation of one's estimates, especially in a market which is characterized by a limited number of landowners. So any one landowner's estimate of present value will be related to the intentions and future uses of neighbors. Lastly, as noted by Smith (1967)<sup>29</sup>, a limited number of landowners will often cause such subjective estimates of present value to be overly optimistic. Clearly, a landowners' likelihood to sell should reflect these factors.

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<sup>29</sup> Smith, op. cit., p. 51

In terms of the investment model then, expectations will be expected to affect the present value of one's property. Thus, anticipation of more intensive use of one's property will act to increase one's notion of its present value. As long as these expectations work to increase one's present value faster than the current market value of the property, it can be assumed that the property will remain in its present use. If not, the property will have a greater likelihood of sale.

Before proceeding to a consideration of the factors which influence a landowner's enrollment decision, two caveats to the investment model should be added. First, it should be emphasized that the sale of a property will not always result in a change in its use, i.e., from farming to residential development. Indeed, properties which have been farmed for generations have often been sold many times over while retaining the same use. As stressed by Coughlin (1980)<sup>30</sup>, the critical issue is whether there is a demand for residential and industrial developable land in the area, and whether potential developers of such land can offer a higher price than farmers or others who hope to acquire an estate. Within the urban fringe area, however, developers with high incomes will usually have higher bid prices than persons wishing to buy land for farming.

Because of this, owners of undeveloped land in areas of high development potential who intend to sell their land often will be more likely to sell their land to a developer than to one who desires to continue farming or some form of undeveloped use. As a result they will be less likely to enroll their land in a preservation program which restricts the form of its use. Likewise, in areas

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<sup>30</sup> William Coughlin, "Differential Assessment and the Conversion of Land to Urban Uses," in Property Tax Preferences for Agricultural Land, New York: University Books, 1980, p. 55.

where urban pressures aren't as strong and the viability of farming is greater, buyers who intend to farm or retain the land in open space will be better able to compete with potential developers.

Lastly, a landowner may sell a portion of his land without relinquishing all of his holdings. Reasons such as increase liquidity, capital gains, or allowing one's son or daughter to build a home are often cited for the sale of property. Selling property, a landowner may decrease holding costs and thus increase his present value while retaining a portion of his land.

## CHAPTER 4

### THE EFFECTS OF ENROLLMENT IN THE PROGRAM ON LANDOWNER DECISIONMAKING

From the preceding chapter, it should be obvious that the interaction of certain factors related to the economic viability of a landholding and the demographic makeup of its owner will help one predict whether such a landowner will decide to hold or sell his/her land. In this chapter the model proceeds to include the effect of benefits such as tax credits which accrue from P.A. 116 on the buy/sell decision, and ultimately the land-use behavior of the owner.

Since tax savings are among the principal benefits of enrollment in the program, the "squeeze" which is experienced by urban fringe owners often can be alleviated. Similarly, the protection of open space and wildlife is promoted. Whether these benefits will actually deter development by increasing the economic viability of the land in use depends on their magnitude as well as other factors such as the personal characteristics of the landowner, and the demand for developable land in the area.

In other words, it can be shown that the program's provisions will significantly affect landowner decisionmaking, specifically those decisions that are related to pecuniary considerations, to the extent that they influence a landowner's perception of the present value of his land. Thus to make accurate predictions concerning the holding/selling decision, the provisions of the program can be applied to the investment model as well. First, however, external factors related to the rate of acceptance among landowners will be considered.

#### 4.1 ENROLLMENT CHARACTERISTICS

As stated from the outset, the program was originally designed to preserve farmland from nonfarm uses. The mechanism used to achieve this has been

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characteristically pecuniary: by enrolling, landowners (especially those located in the urban fringe) are able to strengthen the viability of their operations by avoiding increases in property taxes and assessments which are made for improvements. As a result, the costs of holding land should decrease. While some farmers will enroll specifically for these benefits, it can be assumed that others will enroll for nonpecuniary reasons related to the "love of farming" and/or the protection of farmland and wildlife (the tax credit is, of course, an added benefit). So, as in the buy/sell decision, enrollment is dependent on both of these factors. Their complexity, however, makes it difficult to categorize them according to strictly pecuniary and nonpecuniary factors -- so often they can be said to be influenced by a combination of the two. Indeed a recognition of these factors and an empirical analysis of the extent of their influence on the decisionmaking process follows.

#### 4.1.1. Empirical Studies

Economic and empirical studies of the adoption process of agricultural innovations and voluntary programs have typically focused on the enhancement of net pecuniary returns which are offered through the use of such a program and/or innovation. A study of the adoption of a land use program similar to P.A. 116 -- The California Land Conservation Act of 1965, was made by Carman (1977) <sup>31</sup> using this type of approach. Without going into its specifics, the study found that variations in the rate of enrollment among landowners were primarily due to variations in the expected net returns of enrolling land in the program. As expected, the principal return consisted of tax savings due to lower assessed valuations.

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<sup>31</sup> Roy Carman, "California Landowners' Adoption of a Use Value Assessment Program," Land Economics, August 1977, p. 275-87.

The specification of a model to test the extent of these returns, however, proved to be quite difficult. The magnitude of factors already cited in this particular study such as expectations regarding future development potential, tax savings, as well as the "premiums associated with agricultural use" were recognized as variables that were the most important (but most difficult to measure) in the enrollment decision.

Factors in the enrollment decision among landowners in Michigan's P.A. 116 were explored in a similar study by Cochrane (1976)<sup>32</sup> Among the reasons commonly cited as most important was the "desire to obtain relief from rapidly rising property taxes." Second most important was a personal desire on the part of the landowner to retain land in agriculture. Next, the willingness to preserve farmland for future generations and the exemption from nonfarm special assessments were respectively cited as reasons by landowners surveyed for the enrollment of their land.

Lastly, an analysis of open space taxation in Washington by Barron and Thompson (1973)<sup>33</sup> revealed similar preferences. As above, the authors recognized that applicants for the program were motivated strongly by lower property taxes. In general, a maximization of private rather than social welfare was seen as the principal response to the program. Reflecting this, the four primary reasons cited by responding landowners for enrollment were: the magnitude of the property tax; the desire to prevent a land use change; home location; and the willingness to hold land until retirement.

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<sup>32</sup> Mark Cochrane "An Evaluation of Public Act 116, Michigan's Farmland and Open Space Preservation Program," Unpublished Master's Thesis, Department of Agricultural Economics, Michigan State University, 1976.

<sup>33</sup> James Barron and James Thompson, "Impacts of Open Space Taxation in Washington," Bulletin 772, Pullman, Washington: Washington Agricultural Experiment Station, Washington State University, 1973.



#### 4.2 ECONOMIC EFFECTS OF ENROLLMENT

Returning to the investment framework that was set forth in the preceding chapter, it is clear that a given property will have an economic value equal to the sum of its future land rents discounted to the present. Applying Ricardo's theory of economic rents to this framework once more, it can be assumed that the value of land resources will represent the future income stream from the use of the land. Since property taxes will reduce the net income which can be derived from land, their increase will typically lead to a decrease in the market value of the property.

To illustrate the effect of property taxes on the present value of one's property, the example from the preceding chapter can be used once again. If a tax of \$500 is assessed to the property each year, annual net farm income decreases to \$4500, and the present value of the land will decrease by approximately ten percent, from \$112,140 to \$103,996. It is clear then that increases in property taxes will decrease the present value of one's land, and promote its sale.

Therefore, by decreasing property taxes, enrollment will effectively lower a landowner's holding costs. The amount of decrease in these holding costs will vary, however, and depend to a large degree on the landowner's household income. By the Act's definition, household income includes:

- \* the excluded portion of capital gains
- \* social security
- \* retirement benefits, pensions, annuities, and interest
- \* gifts of over \$300
- \* all other income

Since the amount which is credited from property tax is calculated from the amount of one's income, it is evident that the benefits which accrue from enrollment will depend on the amount of household income, since income earned from sources outside the farming operation itself will obviously increase the base

available for the tax credit and, as a result, decrease the benefits of enrollment. Thus, those landowners who earn a majority of their income from nonfarm sources are less likely to benefit; hence they will be less inclined to participate in the program.

Also important is the combination of these two factors- property taxes and income, and their anticipated future movements. Hepp and Ott (1975)<sup>34</sup> illustrate the magnitude of this benefit by comparing different levels of income and property taxes and these movements. From the figures below, it is obvious that the attractiveness of the program varies by level of income. Thus while the absolute benefit is greater for lower income landowners, the relative change in benefit is greater for high income landowners as the anticipated property tax increases. In keeping with the original intent of the law, it can be concluded that enrollment will benefit landowners in areas which are experiencing relatively high increases in assessed property values- typically those areas in the expanding urban fringe.

#### 4.2.1 Behavioral Effects of Increased Economic Viability

It is clear then that a decrease in property taxes as a result of enrollment in the program will increase the present value of one's holdings. Consequently, landowners who would have otherwise sold their land because of urban pressures may be more likely to hold on to it, if this increase in present value is greater than it would be in an alternative use. For this, the rate at which the present and market values increase will be crucial in determining whether a property will be enrolled. So, although enrollment may increase the present value of one's land

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<sup>34</sup> Ralph E. Hepp and Steven L. Ott, "Farmland and Open Space Act," Ag. Econ. Staff Paper #75-7, 1975.

enough to offset rising market values, if the market rate is still higher than the present value, one would be expected to sell land unless some strong nonpecuniary factor intervenes to offset this increase. In other words, for those expecting development, the anticipated increases in land values may be greater than the gains which will accrue from tax benefits. For this, it can be assumed that enrollment will be lowest in those areas where market values are increasing at a faster rate than present or use values. Again these are typically urban fringe areas.

Second, enrollment can counteract the effect of factors such as vandalism, complaints, and other externalities which often accompany urban development. Applying the investment model to this scenario, it is clear that a decrease in property taxes may offset the costs which these effects create and leave one's present value unaffected. Likewise, an exemption from special assessments which are associated with urban development will increase present values as well. Still, for landowners who experience a strong feeling of impermanence due to the influx of new suburbanites, lowered costs may not make up for the loss of "psychic income" which was formerly derived from a more rustic form of ownership.

Lastly, as mentioned at the conclusion of the preceding chapter, the benefits which accrue to landholders as a result of enrollment should allow them to retain all of their land, since they will be better able to refuse purchase offers. In terms of the investment framework then, enrollment will reduce property taxes and increase the present value of one's holdings. Sales of land then should be lower among enrollees than nonenrollees. (It is hypothesized that purchases of land among the two groups will be reflected by these considerations as well. For this, past and anticipated purchases of land will be more likely for enrollees than nonenrollees.)

#### 4.2.2 Demographic Characteristics

Even if the provision of P.A. 116 increases the economic viability of one's landholding, other factors may determine whether or not it will be held in its current use or sold for development purposes. Reasons such as the reluctance of a landowner's heirs to take over and maintain property, as well as the landowner's age have already been cited as principal motivators for the sale of land. In terms of the investment model which has been set forth, these factors can be strong enough to negate the beneficial effects which accrue from participation in the program.

The first of these factors- age, is expected to have an inconclusive relation to enrollment. Although it was noted in the previous chapter that "psychic income" could be related to age since one often has a tendency to become attached to a particular parcel of land over time, certain circumstances may work to negate the effect of this factor. Probably the most important of these is life cycle. In reference to New Jersey's policy of differential assessment of farmland, Coughlin (1980) <sup>35</sup> has this interesting observation concerning lifecycle:

Demographic or life-cycle reasons account for the majority of farm sales...Although economic considerations undoubtedly play an important part in many such sales, it is probably safe to say that roughly half of all decisions to sell are made on entirely noneconomic grounds. Whatever effect differential assessment may have will be felt only in some portion of the remaining half of all sales.

This characteristic was confirmed by Cochran (1976) <sup>36</sup> in his survey of P.A. 116 enrollees throughout the entire state of Michigan. Indeed one's decision to enroll will often be influenced by the stage that they find themselves in the lifecycle. While factors such as "love of the land", one's affiliation with farming as a way of life, and even tradition or habit as noted above may be significant to

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<sup>35</sup> Coughlin, op. cit., p. 55.

<sup>36</sup> Cochran, op. cit., p. 61.

the behavior of older landowners, young owners often do not feel as attached to their land. As a result, those who foresee deteriorating conditions from urban advances or declining economic viability of farming as a way of life may find it easier to move their operations or exit from farming completely. Similarly, at the other end of the lifecycle, landowners who are about to retire may consider selling their property in order to finance their retirement. Consequently, one would expect enrollment to be more prevalent among middle aged landowners than those which have more recently acquired land or those contemplating retirement. These considerations are expected to apply to the length of time one has held land as well-- for this, owners at the extremes are less likely to be enrollees.

Similarly, the benefits which accompany enrollment are expected to affect the behavior of landowners with certain demographic characteristics. With respect to purpose, those who derive some "psychic income" from land ownership along with current monetary income (such as farmers) will benefit more from enrollment than those who do not (such as those who lease their land). For those who still have strong nonpecuniary motivations for holding their land, enrollment will act to strengthen them. Indeed, interviews with officials in the townships most influenced by urban development revealed that the majority of the enrollees were motivated by strong nonpecuniary considerations such as the love of farming, and were unaffected by these rising land prices. By contrast, corporations are much less likely to be influenced by nonpecuniary factors such as personal commitments toward keeping the land in agricultural use. And with respect to motivation, a similar reasoning applies.

#### 4.2.3 Participation Related To Landowner Expectations

Applying the same logic which was used in predicting the buy/sell decision in areas of high development potential, it can be hypothesized that those expecting development in the near future will be less likely to enroll their land in the

program than those who have more distant development expectations (if perfect information concerning the value of one's land is assumed for all landowners).

As outlined in the preceding chapter, expectations should affect the present value of one's property. Thus, the anticipation of a more intensive use for one's property will act to increase one's notion of its present value. Given constant property values in a particular area, it can be assumed that those who expect their property to be developed within the minimum contract period- ten years, will not enroll.

Lastly, since the program allows for the sale of land when its use is not significantly altered, it can be hypothesized that landowners who are enrollees and intend to sell their land within the length of their contract will be located in areas of low potential development since the demand for its use in alternative form is remote. (By definition, if they had planned to change the use of their land within the given contract period they would not have enrolled in the program). And unless nonpecuniary "income" from community responsibility to open space is extremely high, one's present value will be more likely to be exceeded by a potential developer's offer than a farmer's.

#### **4.3 CONCLUSIONS**

Benefits which accrue from enrollment in a preservation program are expected to alter a landowner's decisionmaking, specifically those decisions which are related to the economic viability of property. The criteria used to determine the influence of the program is related to the present value of one's land; thus as the landowner's perception of this value increases as a result, enrollment is likely to occur. To test these assumptions, an empirical analysis will be made of the extent of these factors on decisionmaking in the following chapter.

## CHAPTER 5

### ANALYSIS OF SURVEY RESULTS

In the preceding chapter, it was held that the provisions of the Farmland and Open Space Preservation Act would enhance the economic viability of one's landholding. As a consequence, the holding's present value would increase, and the likelihood of its sale for an alternative use would be diminished.

Whether these provisions actually deter the sale of one's property for development, however, depends on a number of different factors. Age, length of ownership, and other nonpecuniary factors such as purpose and motivation were cited as important supplementary variables in one's decision to hold or sell land. Similarly, the profitability of the land itself in an alternative use was also deemed to be important. Indeed the combination of these were considered to be powerful enough to negate the purely economic effects of enrollment. Thus, participation in the program would be related to the magnitude of nonpecuniary variables as well. The relationship between these variables and enrollment is now considered; first, a brief overview of the study area and methodology is necessary.

#### 5.1 THE STUDY AREA

The Greater Lansing, Michigan area including Clinton, Eaton, and Ingham counties was chosen to examine the relationship between these variables and enrollment. Figure 1 shows the relation between the study area and the limits of the city of Lansing. For study purposes, the area of potentially high development was defined as all parcels located within the following townships: Alaiedon, Bath, Benton, Delhi, Delta, DeWitt, Meridian, Oneida, Watertown, Williamstown, and Windsor.

This area was originally chosen because it represents one of the fastest growing metropolitan regions in the State of Michigan. Indeed, among the

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townships listed above, the average rate of population increase was 25.55% over the period 1970-82, while the rate for the state of Michigan as a whole was 2.4%.<sup>37</sup> Similarly, for new privately owned housing units which were issued in the period 1985-present, these townships are among the highest in the state for metropolitan areas of a similar size.<sup>38</sup>

For property values, a similar pattern was revealed. During the period 1981-86, the state equalized valuation for these counties increased by 21.0%, while similar values for the state as a whole increased by 15.4%.<sup>39</sup> Lastly, since the program was adopted to "alleviate (this) rapid and often premature conversion of lands uniquely suited for agriculture and open space," this area was chosen because approximately 90% of its land can be classified as either prime or unique soils.<sup>40</sup>

## 5.2 STUDY METHODOLOGY

The results of the study were based on a number of sources of information. First, names and addresses of enrollees in the program for the study area: Clinton, Eaton, and Ingham counties, were obtained from the Michigan Department of Natural Resources. The names and addresses of nonenrollees which were surveyed were obtained from the director of equalization in each of these counties.

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<sup>37</sup> Michigan Statistical Abstract 1985, p. 4.

<sup>38</sup> "Housing Units Authorized by Building Permits," Construction Reports, U.S. Department of Commerce, Jan. 1985- July 1987.

<sup>39</sup> Harvey, op. cit. p. 14.

<sup>40</sup> Soil survey maps, Clinton, Eaton, and Ingham counties.

Parcels of land for both of these types of landowners were chosen randomly from official plat maps of the area. In order to assess the impact of potential urban development on landowner decisionmaking, sampling was stratified according to location. These stratifications were based on future land use maps obtained from each of the townships located adjacent to the Lansing city limits. For simplicity, parcels located within the following townships were classified as having high potential development: Alaiedon, Bath, Benton, Delhi, Delta, DeWitt, Meridian, Oneida, Watertown, Williamstown, and Windsor. Parcels of land located in the remaining townships of these counties were classified as having low potential development.

The above landowners were surveyed by mail. A total of 350 surveys were sent out. Given that a lower response rate was anticipated among nonenrollees, 150 of these were destined to enrollees and 200 to nonenrollees. The response rate among enrollees was 52%, while the rate among nonenrollees was 37.5%. Overall, the response rate was 43.4%.

Data received from these respondents were analyzed for measures of dispersions. In addition to frequencies for each of the behavioral variables which were tested, chi-square tests were made to determine whether the observed differences for these variables among enrolled and nonenrolled landowners were due entirely to chance. As in previous studies on enrollment in preservation programs, this statistic was used instead of regression analysis since a high degree of multicollinearity among these variables was anticipated. (To refer to the actual questionnaires which were used, see Appendix A.)

Lastly, since the response rate was higher than expected, a supplementary survey of planning and zoning administrators and assessing officers in each of the townships in the Greater Lansing Area was conducted before the mailing to strengthen this response. Similarly, patterns of land use and indications of future

use were obtained by these officials as well as extension directors and administrators in the Departments of Development in each of the counties.

### 5.3 PARTICIPATION BASED ON ECONOMIC FACTORS

It was first hypothesized that enrollment would increase the viability of one's land holdings by decreasing the costs associated with ownership. For more landowners, property taxes comprise the bulk of these costs. Other costs such as vandalism and lawsuits arising from urban encroachment were also recognized.

#### 5.3.1 Household Income

Since the base which is used for the tax credit is derived from one's household income, the extent to which such viability is enhanced (and hence enrollment) will depend on the amount of household income earned.

To test this assumption, survey respondents were asked to estimate their household income earned in 1986 before taxes. While more enrollees had household incomes less than \$20,000 than nonenrollees (39% to 22.7%), the overall distribution of income is quite similar among both groups. Thus, it can be concluded that household income is not a factor which was significantly related to enrollment in the program.

Among enrollees, income was related to type of operation; since the majority of enrollees were cash grain farmers, this result is not surprising (See Table A1). Beyond this, there was no relationship between income and other demographic variables, and curiously, there was no relationship between household income and nonfarm income either. From this it can be hypothesized that landowners of all incomes were able to derive some portion of their earnings from nonfarm sources. Among nonenrollees, household income was highest among cash and feed grains and lowest among hog farms (See Table 15A). No significant relationship existed among income and size of holdings.

Table 5.1 Household Income of Enrollees and Nonenrollees, Michigan Farmland and Open Space Preservation Act, 1987

Household Income	Enrollees		Nonenrollees	
	No.	%	No.	%
0 - \$10,000	8	10.4	3	4.0
10,000 - \$20,000	22	28.6	14	18.7
20,000 - \$30,000	11	14.3	12	16.0
30,000 - \$40,000	13	16.9	12	16.0
40,000 - \$60,000	8	10.4	14	18.7
60,000 - \$80,000	4	5.2	6	8.0
80,000 - \$100,000	1	1.3	3	4.0
Over \$100,000	2	2.6	4	5.3
Missing	8	10.4	7	9.3
Total	77	100.0	75	100.0

Chi-square level of significance = .3478

### 5.3.2 Nonfarm Income

While both groups appear to have earned income from nonfarm sources, a much greater percentage of nonenrollees (63.5 to 44.3) recorded nonfarm incomes in excess of 50% of their total household income. Unlike total household income then, nonfarm income can be considered a factor which is related to enrollment. This result is not surprising, since larger nonfarm incomes reduce the possible tax credit, and hence, one's incentive for enrollment.

Table 5.2 The Percentage Nonfarm Income of Enrollees and Nonenrollees, Michigan Farmland and Open Space Preservation Act, 1987

Percentage Nonfarm Income	Enrollees		Nonenrollees	
	No.	%	No.	%
0 - 10%	24	31.2	12	16.0
10 - 20%	6	7.8	7	9.3
20 - 30%	3	3.9	2	2.7
30 - 50%	8	10.4	2	2.7
More than 50%	32	41.6	47	62.7
Missing	4	5.2	5	6.7
Total	77	100.0	75	100.0

Chi-square level of significance = .0306

As for household income, nonfarm income among enrollees was highest among cash grain and beef, and lowest among dairy farms. (See Table 2A) for length of ownership, nonfarm incomes less than 10% and greater than 50% were associated with parcels that were held longer than 20 years (See Table 3A). Similarly, no precise correlation was seen between size of holdings and nonfarm income, as an equal number of enrollees with holdings in excess of 120 acres had nonfarm incomes above 50% and below 10% (See Table 6A).

Not surprisingly nonfarm income was, highest among those nonenrollees who leased their land (See Table 18A). Similarly, owners who listed "residential" for motivation earned more than 50% of their income from nonfarm sources (See Table 19A). A majority of farms greater than 40 acres had nonfarm incomes above 50% as well (See Table 20A).

#### **5.4 PARTICIPATION BASED ON OWNERSHIP CHARACTERISTICS**

As above, it was hypothesized that the presence of certain nonpecuniary factors would act to negate the effect of benefits accruing from enrollment among landowners of certain characteristics. For this, significant differences in both the presence and magnitude of these characteristics among both enrollees and nonenrollees are expected to exist.

##### **5.4.1 Age**

Noneconomic factors such as one's stage in the lifecycle (retirement) were seen to be important in one's decision to enroll, since it was hypothesized that younger landowners would not have the degree of emotional attachment to their land as older landowners. It was also thought that those nearing retirement were more likely to want to sell their land than the middle-aged. Thus, large divergencies in age distribution among enrollees and nonenrollees - especially among those ages 65 and over, and under 30 were anticipated.

For the observed population, within the age group 65 and over this subhypothesis is borne out, since fewer landowners of this category are enrolled. Also among middle aged landowners, more enrollees than nonenrollees were represented in the survey population. Still for the variable of age as a whole, there is no significant difference between the number of enrollees and nonenrollees among all categories. So it can be concluded that enrollment is unrelated to age at both the .05 and .1 levels of significance.

Not surprisingly, age was related to length of ownership among enrollees (See Table 7A). Similarly older enrollees were more likely to organize their property in a partnership, they tended to have larger holdings (See Table 8A), and a significant portion of them earned more than 50% of their income from nonfarm sources (See Table 9A). Likewise, length of ownership was related to age among nonenrollees (See Table 21A). Older nonenrollees were more likely to lease their land to others, own their land for residential purposes, and were likely to have earned at least half of their income outside the farm (See Table 23A).

Table 5.3 The Age of Enrollees and Nonenrollees, Michigan Open Space and Preservation Act, 1987

Age of Landowner	Enrollees		Nonenrollees	
	No.	%	No.	%
25 - 34	3	3.9	3	4.0
35 - 44	9	11.7	10	13.3
45 - 54	18	23.4	11	14.7
55 - 64	24	31.2	19	25.3
65 and over	23	29.9	32	42.7
Totals	77	100.0	75	100.0

Chi-square level of significance = .4379

#### 5.4.2 Organization

It was also assumed that the organization of one's property - individual, partnership, and/or corporation would have a bearing on enrollment as well. While

the distinction between an individual ownership and a partnership are often indistinguishable, there were considerably more enrollees who listed the organization of their property as a partnership, reflecting the size of their operation. Due to this divergence, enrollment and organization can be said to be significantly related.

Table 5.4 The Organization of Property of Enrollees and Nonenrollees, Michigan Farmland and Open Space Preservation Act, 1987

Organization	Enrollees		Nonenrollees	
	No.	%	No.	%
Family or Individual	56	72.7	72	96.0
Partnership	20	26.0	3	4.0
Corporation	1	1.3	0	0.0
Totals	77	100.0	75	100.0

Chi-square level of significance = .0004

Among enrollees exclusively, partnerships tended to have lower incomes (both household and nonfarm); were located in areas of high potential development; and their owners were typically older - 55 and above.

#### 5.4.3 Purpose

In terms of one's purpose for holding land, it was assumed that landowners who held their land for future sale and/or lease to others would be less likely to enroll in the program than those whose principal purpose was farming since, by definition, those intending to sell land are not likely to be committed personally to preserving open space. The results of the population survey support this notion as a greater proportion of nonenrollees - especially cash grain farmers and those located in areas of high potential development, were seen to hold their land for lease to others than enrollees. Specifically, the chi-square statistic indicates that differences in the distribution of these purposes cannot be due to chance. Thus, purpose and enrollment were seen to be related at the .011 level of significance.

Table 5.5 Purpose for Holding Land of Enrollees and Nonenrollees, Michigan Farmland and Open Space Preservation Act, 1987.

Purpose for Holding Land	Enrollees		Nonenrollees	
	No.	%	No.	%
Farming	<u>72</u>	<u>93.5</u>	<u>51</u>	<u>68.0</u>
Lease to others	3	1.3	16	21.3
Sale for future development	2	2.6	3	4.0
Other	<u>0</u>	<u>0.0</u>	<u>5</u>	<u>6.7</u>
Totals	77	100.0	75	100.0

Chi-square level of significance = .0005

#### 5.4.4 Motivation

Like the variable purpose, landowners motivated primarily by farming for the acquisition of their land were seen to be more likely to enroll in the program than owners who acquired their land for a residence or for investment purposes. Indeed, the vast majority of enrollees - 93.2% listed farming as the motivation for acquiring their land. And since considerably more nonenrollees listed residential use as their motivation for acquiring land (especially those located in areas of high potential development - see Table 24A), it can be concluded that the variables motivation and enrollment are strongly associated - especially since most of those listed as residential had nonfarm incomes in excess of 50%.

Table 5.6 Motivation for the Acquisition of Land of Enrollees and Nonenrollees Michigan Farmland and Open Space Preservation Act, 1987.

Motivation	Enrollees		Nonenrollees	
	No.	%	No.	%
Farming	<u>72</u>	<u>93.5</u>	<u>54</u>	<u>72.0</u>
Residential	1	1.3	13	17.3
Investment	2	2.6	6	8.0
Nonfarm Development	0	0	1	1.3
Other	<u>2</u>	<u>2.6</u>	<u>1</u>	<u>1.3</u>
Totals	77	100.0	75	100.0

Chi-square level of significance = .0028



#### 5.4.5 Type of operation

Among those who listed farming as a motivation for acquiring land, significant differences existed for type of operation among enrollees and nonenrollees. While nearly the same percentage listed cash grains for type of operation, differences among the groups were most obvious for the categories beef, hogs, and dairy. Indeed, the existence of such a disparity indicates that a number of factors - both pecuniary and nonpecuniary, are involved. First, 10 out of the 11 enrollees who were listed as "dairy" and 3 out of 5 of those listed as "beef" had nonfarm incomes less than 50%. Strangely enough, the same pattern held for nonenrolled hog farmers as well.

Since all of the beef farmers were located in areas of high potential development, it can be hypothesized that the costs of urban encroachment were large enough to warrant their participation (See Table 11A). For hog farmers, the opposite may be true, as all were located in areas which do not appear to be threatened by development (See Table 25A). Since half of these farmers were over the age of 55, it is rather surprising that a majority claimed that they "weren't interested." In general, as a result of these differences, the relationship between type of operation and enrollment was seen to be significant at the .000 level.

Table 5.7 Type of Farm Operation of Enrollees and Nonenrollees, Michigan Farmland and Open Space Preservation Act, 1987

Type of Operation	Enrollees		Nonenrollees	
	No.	%	No.	%
Cash Grains	49	63.6	54	72.0
Feed Grains	2	2.6	6	8.0
Beef	5	6.5	0	0.0
Hogs	0	0.0	6	8.0
Dairy	11	14.3	0	0.0
Fruit/Vegetable	2	2.6	0	0.0
Poultry	0	0.0	1	1.4
Other*	8	10.4	4	5.3
Missing	0	0.0	4	5.3
Totals	77	100.0	75	100.0

Chi-square level of significance = .0000

\* The most common responses were hay, alfalfa, and forestry.

#### 5.4.6 Length of ownership

Because of nonpecuniary considerations such as one's attachment to land, it was hypothesized that the length of time which one had owned land would be an important factor in their enrollment. For landowners who had held their land for over twenty years, this assumption was not confirmed by those in the survey population, as an equal number of nonenrollees and enrollees responded. Throughout the category as a whole, however, the distribution among groups was fairly nonhomogenous.

Not surprisingly, among both enrollees and nonenrollees, the length of ownership was significantly related to the age of the landowner. Nonetheless, nonfarm income's relation to length of one's ownership was found to be somewhat less clear. While all types of nonenrollees of this category typically had nonfarm incomes in excess of 50%, enrollees of all lengths were split between nonfarm incomes less than and greater than 50%. Similarly, while there was a significant relationship between number of acres owned and length of ownership among enrollees (See Table 12A), no such pattern existed among nonenrollees (See Table

26A). Lastly, no relationship existed between this variable and type of operation among both types of landowners. Due to these differences, it can be concluded that length of ownership can be considered a factor which is related to enrollment. However, since the observed level of significance was .0819, this factor's magnitude is lower than others which have been discussed.

Table 5.8 Length of Ownership of Enrollees and Nonenrollees  
Michigan Farmland and Open Space Preservation Act, 1987

Length of Ownership	Enrollees		Nonenrollees	
	No.	%	No.	%
Less than 10 years	7	9.1	5	6.7
Between 10 and 20 years	3	3.9	11	14.7
Between 15 and 20 years	13	16.9	7	9.3
More than 20 years	52	67.5	52	69.3
Missing	2	2.6	0	0.0
Totals	77	100.0	75	100.0

Chi-square level of significance = .0819

#### 5.4.7 Acreage

The relationship between enrollment and size of landholdings was hypothesized to be dependent on one's holding costs, since total property taxes levied would be higher for larger operations than smaller ones. As for length of holding, one's attachment to land was thought to be dependent on size as well. Indeed, the results of the survey confirm this hypothesis, since the vast majority of enrollees have holdings in excess of 120 acres. Overall, the relationship between acreage and enrollment was found to be highly significant.

Among enrollees, size of holding was not related to any of the other demographic variables except for motivation; nonetheless, as expected, cash grains and dairy farms had the largest holdings (See Table 13A). Among nonenrollees, size of holding was found to be related to length of ownership, age, and development expectations. Also, it is worth noting that a significant number

of nonenrollees with largeholdings greater than 120 acres claimed that they didn't enroll because they "wanted to keep development options open."

Table 5.9 Size of Landholding of Enrollees and Nonenrollees, Michigan Farmland and Open Space Preservation Act, 1987

Size	Enrollees		Nonenrollees	
	No.	%	No	%
21-40 acres	2	2.6	6	8.0
41-80 acres	4	5.2	22	29.3
81-120 acres	13	16.9	19	25.3
More than 120 acres	57	74.0	28	37.3
Missing	1	1.3	0	0.0
Totals	77	100.0	75	100.0

Chi-square level of significance = .0000

### 5.5 ENROLLMENT BASED ON LANDOWNER EXPECTATIONS

The relation between expectations and enrollment is evident as well. Most obvious is the fact that none of the enrollees surveyed expected the conversion of their land "from agricultural to developed (nonagricultural) use" in less than ten years, while 13.6% of the nonenrollees anticipated development within this period. At the other end of the scale, nearly twice as many enrollees expected development in twenty years. Therefore, development expectations can be considered to be important in the decision to enroll.

Table 5.10 Development Expectations of Enrollees and Nonenrollees, Michigan Farmland and Open Space Preservation Act, 1987

Development Expectations	Enrollees		Nonenrollees	
	No.	%	No.	%
Less than 10 years	0	0.0	12	14.7
Between 10 and 15 years	7	9.1	9	12.0
Between 15 and 20 years	2	2.6	3	4.0
More than 20 years	30	39.0	17	22.7
Don't know	38	49.4	34	46.7
Totals	77	100.0	75	100.0

Chi-square level of significance = .0044

Also, as expected, a significant difference (among enrollees, chi-square = .1121; nonenrollees, chi-square = .0151) existed for responses given by landowners of both types by development potential as well. (See Tables 14A and 28A) The implications of this are clear: the behavioral model can be considered accurate; landowner expectations appear to be reasonably accurate as well.

## 5.6 MAGNITUDE OF FACTORS

Beyond a description of the factors which help determine enrollment, a secondary objective of this study was to understand the relative magnitude of these factors as well as potential development and their effect on future land use in the area. For enrollees, an inquiry of this sort requires an analysis of one's present and future commitment to the program. For nonenrollees, the magnitude of these factors is considered by eliciting one's reasons for not enrolling, and determining the point at which the economic benefits of enrollment become attractive enough to counteract those factors which have been previously outlined.

### 5.6.1 Reasons for Enrollment

First, participants were asked to rank eight factors in terms of their importance as an impetus for enrollment. Among them it is clear that the program's reduction in taxes was important. Love of farming and protection of farmland were cited as the next most important reasons respectively. The frequency response table shown on the next page, outlines the relative magnitude of all these factors.

### 5.6.2 Portion of land enrolled.

The portion of one's total holdings which are enrolled in the program was suggested to be a test of program commitment. Interviews with Extension agents in the area of study revealed that withholding of land from a contract was quite common, and even encouraged by local officials, to enhance the owner's flexibility

Table 5.11 Reasons for Enrollment  
Michigan Farmland and Open Space Preservation Act, 1987

Rank	1	2	3	4	5	6	7	8
Tax benefit	68.8	10.9	15.6	1.6	--	--	1.6	1.6
Love of farming	25.0	43.2	18.2	9.1	4.5	--	--	--
Protection of farmland	20.0	43.3	26.7	3.3	5.0	--	1.7	--
Protection of natural habitat	3.1	6.3	25.0	34.4	9.4	12.5	3.1	6.3
Not ready to develop	--	11.5	19.2	11.5	26.9	7.7	15.4	7.7
To avoid special assessment	--	5.2	7.8	2.6	2.6	11.7	1.3	5.2
To discourage purchase offers	--	3.8	26.9	3.8	15.4	7.7	34.6	7.7
Threat of Urban Expansion	8.0	4.0	8.0	32.0	8.0	8.0	4.0	28.0

in land use decisionmaking. From this, it was deduced that withholding land from a contract would signify hesitancy toward preserving land, since one could earn money and/or increase cash flow by doing so. However, since the program allows a landowner to change a portion of his land to a nonagricultural use, such as selling a lot to another family member, a high percentage of land withheld could quite possibly obscure the owner's final intent. For this, enrollees were asked if all of their land was currently under contract. A positive answer was assumed to be strong evidence of a commitment to land preservation, while a negative response demonstrated "hold out", unless of course a portion was being held for sale to a family member.

Using this criteria, commitment to preservation appears to be strong, since 64.9% of the responding enrollees had contracted all of their land. and among

those who hadn't, 35.3% claimed that they did so in order to sell a lot to a family member, while another 35.3% did so to earn capital gains.

All types of operations withheld land from the program, beef and dairy having the highest percentage. Among these, only cash grains and dairy farmers had done so to earn capital gains. Land withheld is also related to the size of the operation, as the highest percentage had holdings in excess of 120 acres. With respect to age, owners 45-54 had withheld the highest percentage. Lastly, no significant difference in the withholding of land existed among landowners of different development potentials.

### 5.6.3 Length of current contract

Longer contracts were most prevalent among dairy and cash grain operations, landowners with lower household incomes (and those who earned either 10% or 50% of their earnings from nonfarm sources) and, not surprisingly, those farms greater than 80 acres. Owners ages 35 to 55 had the greatest number of contracts in excess of 30 years. And it is encouraging to note that two landowners over age 65 had contracts of over 30 years as well!

A further test of contract commitment among enrollees was the comparison between the length of one's contract and their expectations. For this it was assumed that if an enrollee expected development within ten years and enrolled his land in the program for a period of time greater than ten years, his commitment to the program could be considered strong. In general, the gap between one's expectations and length of contract was used as a proxy measurement for one's commitment to keeping land in its present use. For this, these two responses were compared. And of those who expected development within twenty years, only 3 out of 70 enrolled their land in a contract greater than 20 years. At the other end of the spectrum, of those who expected development in more than twenty years, 24 of 70 had enrolled their land in contracts for less

than this period of time (See Table 29A).

It can be concluded from these results then that commitment to keeping land in its present use is somewhat less strong than it was felt above. Still, since 33 out of 70 enrollees were unsure about when development would actually occur, doubts about overall commitment cannot be concluded unconditionally. Also, it is encouraging to note that there were no differences among enrollees by development potential.

#### 5.6.4 Willingness to accept longer contract

As above, the extent of one's commitment to keeping land in its present form could be inferred from the minimum contract length one would be willing to accept. For this, enrollees were asked if they would accept a contract if its minimum length were 15 years instead of 10. Among those responding, 94.0% claimed that they would do so. However, when the minimum contract length was increased to 20 years, the expressed willingness decreased to 66.7% (The highest percentage of those who wouldn't have enrolled were cash grain farmers, farms greater than 80 acres and, obviously, those between the ages 46-65; there was no relationship between income - household and nonfarm and willingness to accept a longer contract). Interestingly, 27.3% of those who would not have accepted a contract for twenty years didn't expect development within this time period. At the opposite extreme, only 2 of 44 enrollees who said that they would have accepted a contract of this length did expect development within twenty years (See Table 30A). Nonetheless, these results imply that commitment to preserving open space should be strong in the near future as well - particularly among those located in areas of high development potential, since no significant differences existed among enrollees for this variable.



#### 5.6.5 Commitment to the provisions of contract

Another question concerned the effect of the program on an enrollee's decision to change land use. For this, enrollees were asked if they would break their enrollment "upon receiving an attractive offer" to sell their land. 72.9% of those responding claimed that they would not do so. Cash grains and operations listed as "other", those earning less than \$20,000, farms in excess of 120 acres, as well as landowners of ages 55-65 were among those who claimed that they would. Apart from these, the degree of commitment which has been revealed to this point is strengthened by such a result.

#### 5.6.6 Credit necessary to prevent land use change

The study also attempted to elicit the strength of one's commitment to keeping land in its current use by determining the effectiveness of the credit which is offered under the program. Toward this end, enrollees were asked the amount of property tax credit which would be necessary under P.A. 116 to influence them not to sell their land. The extent of the enrollees' integrity toward this objective can be seen below, since over half of them claimed that any increase in the tax credit would be ineffectual. Nonetheless it is important to note that of those who expressed interest in selling their land beyond the terms of the contract, one-third claimed that no increase in their tax credit would be sufficient to prevent them from doing so.

Among those who needed the least amount of incentive to preserve their land -- 10% or less, were cash grain farms, those with holdings greater than 120 acres, those earning less than 20% from nonfarm sources, and middle aged owners (ages 35-65). However, due to their prevalence among all enrollees, the middle aged were also the most intransigent to economic incentives -- especially those aged 45-54.

Table 5.12 Increase in Property Tax Credit Under P.A. 116 Needed to Prevent a Change in Land Use Enrollees, Farmland and Open Space Preservation Act, 1987

Response	No.	%
Wouldn't affect my decision	11	14.3
5%	1	1.3
10%	9	11.7
25% or more	10	13.0
Have no intention to sell under any circumstances	41	53.2
Missing	5	6.5
Totals	100.0	77

### 5.6.7 General effect on the economic viability of one's land

Lastly, enrollees were asked if they felt that the program was a major factor in their ability to maintain their current operation. Of respondents, 77.1% claimed that it was (cash grains and farms listed as "other," those earning between \$30,000 and \$60,000 per year, those with holdings between 81-120 acres, and those aged 55 and over were the most obvious dissenters). And in response to a related question, 67.2% felt that the program helped them "make purchases for equipment and/or improvements" related to their operations (beef, dairy, and other; higher income farmers, those with holdings greater than 80 acres; and those ages 45-54 were the principal dissenters in this case).

## 5.7 HINDRANCES TO NONENROLLEES

Beyond the costs associated with enrollment, such as the lien made on one's land, it was felt that the value of the land in an alternative use would be a major factor in one's decision not to enroll. Similarly, the actual amount of benefit was deemed to be important in such a decision.

### 5.7.1 Reasons for not enrolling

First, explicit reasons for one's nonenrollment were elicited from nonenrollees. Among those responding, the highest percentage claimed that they

didn't know about the program (most notably cash grains farmers, smaller farmers - 41-80 acres, those of ages 65 and older, and those with nonfarm incomes in excess of 50%). And after those who wanted to keep their development options open (typically cash grains, larger farms, those 55 and older, and those with nonfarm incomes greater than 50%), the next highest single response was "not interested" (typically older farmers and those with high nonfarm incomes). Thus, in keeping with earlier findings of the importance of household income, noneconomic factors were cited for nonenrollment in nearly half of the cases. And interestingly, of those who responded "other", most were either wary of government in general, or had reservations concerning their ability to get out of the agreement.

Table 5.13 Reason for Nonenrollment, Michigan Farmland and Open Space Preservation Act, 1987

Reason	<u>No.</u>	<u>%</u>
Didn't know about the program	21	28.0
Didn't qualify	4	5.3
Didn't benefit enough	6	8.0
Wasn't interested	14	18.7
Want to keep development options open	15	20.0
Other	<u>15</u>	<u>20.0</u>
Totals	75	100.0

### 5.7.2 Tax credit necessary to prevent land use change

As above, the study attempted to elicit the point where the benefits of the program would be attractive enough to convince nonenrollees to participate. Like enrollees, the study asked these nonenrollees to determine the amount of tax credit which would prevent them from converting their land to a nonagricultural use. For this, 41.4% claimed that they would consider holding their land for a certain price, which 12% held that any tax credit would be ineffectual in a

decision to sell their land (most obvious among them were large farms, middle aged farmers -- 45-55 years, and those with nonfarm incomes in excess of 50%). Amazingly, 42% had no intention of selling their land under any circumstances! The overall breakdown of response to this question is shown below.

Table 5.14 Percentage Tax Credit necessary to prevent a change in land use nonenrollees, Michigan Farmland and Open Space Preservation Act, 1987

	<u>No.</u>	<u>%</u>
Wouldn't affect a decision	9	12.0
7%	2	2.7
15%	2	2.7
20%	13	17.3
More than 20%	14	18.7
Have no intention of selling under any circumstance	31	41.3
Missing	<u>4</u>	<u>5.3</u>
Totals	100.0	75

## 5.8 BEHAVIORAL DIFFERENCES

Beyond an elicitation of the stated intentions of both enrollees and nonenrollees toward keeping land in its present use, the study also explored the actual performance of these landowners from the time of the program's enactment.

### 5.8.1 Purchases of Land

By increasing the viability of one's holdings, it was also hypothesized that recent purchases of land would be related to enrollment in the program. For this, landowners were asked whether they had purchased land in the past 15 years. Significantly more enrollees were found to have made such purchases to add to their present holdings - specifically those of ages 35-65, than nonenrollees during this time period. However, since a similar number of both enrollees and nonenrollees planned to purchase land within the next five years, it is difficult to determine if such behavior is actually related to program enrollment.

Table 5.15 Purchase of Land Since 1972 among Enrollees and Nonenrollees Michigan Farmland and Open Space Preservation Act, 1987

Response	Enrollees		Nonenrollees	
	No.	%	No.	%
Purchased land	<u>30</u>	39.0	<u>18</u>	24.0
Did not purchase land	<u>47</u>	<u>61.0</u>	<u>57</u>	<u>76.0</u>
Totals	77	100.0	75	100.0

Chi-square level of significance = .0473

Table 5.16 Plans to Purchase Land in the Next Ten Years Among Enrollees and Nonenrollees Michigan Farmland and Open Space Preservation Act, 1987

Response	Enrollees		Nonenrollees	
	No.	%	No.	%
Have plans to purchase land	<u>17</u>	21.1	<u>18</u>	24.0
Have no plans to purchase land	<u>55</u>	<u>71.4</u>	<u>57</u>	<u>76.0</u>
Missing	<u>5</u>	<u>6.5</u>	<u>0</u>	<u>0.0</u>
Totals	77	100.0	75	100.0

Chi-square level of significance = .9559

### 5.8.2 Sales of Land

As above enrollees and nonenrollees were asked if they had sold any land from their total holdings in the past 15 years. More nonenrollees had sold land during this period; however, the differences in behavior among these groups is small enough to accept the hypothesis that independence between enrollment and sales of land exists.

Concerning the actual reasons for selling land, no significant differences between the groups existed either. Among respondents who actually sold land, nonenrollees were seen to be more economically rational in their behavior, since a majority of these sales were motivated by profitability (especially among younger landowners, those with low nonfarm incomes and those located in areas of high potential development), while among enrollees, half of the sales were prompted by either state highway construction or family considerations.

Among those who did not sell their land, no significant behavioral differences existed among the groups. While a majority in both cases did not sell because they wanted to "keep their land in its present use," more nonenrollees did not do so because they had not "received any offers". In general then, while land sales cannot be said to be related to enrollment in the program, the behavioral aspects of these sales bear some relation to this variable.

Table 5.17 Sales of Land From Total Holdings in the Past 15 Years among Enrollees and Nonenrollees, Michigan Farmland and Open Space Preservation Act, 1987

Response	Enrollees		Nonenrollees	
	No.	%	No.	%
Sold land	13	16.9	18	24.0
Did not sell land	64	83.1	56	74.7
Missing	0	0.0	1	1.3
Totals	77	100.0	75	100.0

Chi-square level of significance = .2578

Table 5.18 Reason for Selling Land in the Past 15 Years among Enrollees and Nonenrollees, Farmland and Open Space Preservation Act, 1987

Response	Enrollees		Nonenrollees	
	No.	%	No.	%
To profit from a capital gain	1	7.5	3	16.7
Because former use wasn't profitable	2	15.4	6	33.3
To allow son/daughter to live there	4	30.8	4	22.2
Holding costs were too high	2	15.4	5	27.8
Other	4	30.8	0	0.0
Totals	13	100.0	18	100.0

Chi-square level of significance = .1041

Table 5.19 Reason for Not Selling Land in the Past 15 Years among Enrollees and Nonenrollees, Michigan Farmland and Open Space Preservation Act, 1987

Response	Enrollees		Nonenrollees	
	No.	%	No.	%
Haven't received any offers	4	6.2	3	5.4
Would have sold, but price was too low	3	4.7	7	12.4
Want to keep land in its present use	54	84.4	44	78.6
Other	3	4.7	2	3.6
Totals	64	100.0	56	100.0

Chi-square level of significance = .4861

### 5.9 CONCLUSIONS

From a survey of greater Lansing area landowners, variables which were thought to be related to landholding behavior (and hence enrollment in the Farmland and Open Space Preservation Program) were recognized. Based on the model which was constructed, these variables are as follows:

1. Nonfarm income
2. Organization
3. Purpose
4. Motivation
5. Type of operation
6. Potential development
7. Length of ownership
8. Acreage
9. Development Expectations

Also, two variables cited in the model were found to have no relation to the enrollment decision - age and household income. The relationship among these variables themselves was explored, and their cross tabulations can be found in Appendix B.

Since some of these factors can be considered to be outside the realm of purely economic decisionmaking, it was assumed that an enhancement of the economic benefits of the program would promote enrollment. A majority of landowners, specifically enrollees, claimed that increases in these benefits would not affect their land use. Conclusions and policy implications of these findings follow.

## CHAPTER 6

### COMPARISON OF THE EMPIRICAL RESULTS WITH THE BEHAVIORAL MODEL

The model which has been outlined throughout this study has relied on the premise that certain factors, both pecuniary and nonpecuniary, are inherent in one's landowning behavior. It was also held that the existence and magnitude of these factors will determine whether the benefits of a preservation program influences such behavior. Patterns of enrollment then will reflect these considerations

#### 6.1 ECONOMIC FACTORS

First, given that the tax benefit was cited by participants as their primary impetus for enrollment, it is clear that economic considerations are important in land use behavior. Taking this into account then, the essential question to be asked is 'how much so'? With approximately half of this same population claiming that no amount of tax credit would convince them to change their land use, and another 13% claiming that a mere 10% increase in the tax credit would be enough to convince them not to do so, it appears that such a conclusion warrants qualification.

Since the reasons "love of farming" and "protection of farmland" were cited by 86.5% of these respondents as the second most important impetus for enrollment, it is clear that nonpecuniary factors also play an important role. And since nearly three-quarters of this same group claimed that they would not break their contract upon receiving an attractive offer to sell their land, the importance of pecuniary factors should only be restricted to the enrollment decision itself.

Within the investment framework that was outlined in the third chapter, these results demonstrate that nonpecuniary motivations are important in one's

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decision to hold land. The financial rewards which accrue from enrollment in a preservation program such as P.A. 116 then are an added incentive for this behavior. (This is confirmed by the fact that 77.1% felt the act was a "major factor in the ability to continue their operation" and 67.2% claimed it helped them "make purchases for equipment and/or improvements" related to their operations.) Thus, it can be concluded that the presentation of farmland and the way of life associated with farming which is guaranteed by enrollment will enhance the present value of one's land. Other benefits which accrue from enrollment such as the tax credit will act to enhance this measure as well.

For nonenrollees, pecuniary motivations can also be considered to be relatively weak. Among the reasons which were given in the preceding chapter for nonenrollment, it should be reemphasized that, in nearly half of the cases, noneconomic factors were also involved. However, since half of those who cited these influences claimed that they were unaware of the program, it is difficult to understand the actual extent of this factor. Still, given that only 20% listed "want to keep development options open" as a response, it cannot be concluded that hindrances to enrollment are predominantly economic in nature.

This is further confirmed by the fact that 41.3% of nonenrollees claimed that they had no intention of selling their land under any circumstances when asked about the tax credit necessary to prevent a land use change. So it appears that there is a large proportion of nonenrollees who did not enroll, not because they wanted to keep their development alternatives open, but simply because the benefits of enrollment did not exceed the costs, monetary or otherwise. In other words, enrollment did not enhance the present value of their holdings.

Also, over one-third of responding nonenrollees claimed that a tax credit of 20% or less would be enough to prevent them from converting their land to some other use. Since credits from P.A. 116 typically exceed this amount, it appears

from this that one reason for nonenrollment is not ignorance, but rather unfamiliarity with the extent of benefits associated with participation.

Lastly, the extent to which economic rationality influences landowner decisionmaking among these groups is also reflected by their behavior with respect to land sales. First, the fact that significant differences exist among them (at the .1041 level) for reasons for selling land, it appears that economic considerations play a more important role in decisionmaking among nonenrollees than enrollees - especially among those in regions of high development potential. However, while 12.5% of nonenrollees and 4.7% of enrollees would have sold land if the price were right, a majority of landowners in both cases expressed the desire to "keep their land in its present us."

## **6.2 DEMOGRAPHIC FACTORS**

With respect to characteristics of the landowners themselves, the investment model begs the question, "under what conditions will enrollment enhance the present value of one's holding?" To answer this, characteristics which were tested in the preceding chapter can be addressed in kind.

### **6.2.1 Household Income**

Since there are no significant differences in household income among enrollees and nonenrollees, the hypothesis that these variables are related is refuted. Given that significantly more nonenrollees earned incomes greater than \$40,000, the investment model which has been used suggests that the base which was used for their tax credit was too small to ensure an increase in the present value of their holdings.

### **6.2.2 Nonfarm Income**

As hypothesized, nonfarm income can be considered a determinant of enrollment. Since a larger nonfarm income added to income earned on the farm

will increase one's total income and, as a result, decrease the base for property tax credits, the fact that a larger percentage of nonenrollees had nonfarm incomes in excess of 50% is not surprising. Within the investment framework, it can be hypothesized that landowners who earned a substantial proportion of their income from nonfarm sources (specifically those leasing their land or using it for residential purposes), were unable to increase the present value of their holdings by enrolling.

#### 6.2.3 Organization

Differences in type of organization among enrollees and nonenrollees suggests that partnerships are typically larger operations than those which are classified as individual or corporate. As will be shown below for acreage, it can be assumed that the savings which accrue from enrollment are larger for these operations since property taxes for them are, by nature, higher. Also, it can be speculated that partnerships reflect the desire of a family to continue its operation at a particular location.

#### 6.2.4 Age

While it appears that landowners at one extreme of the lifecycle - over 65, are less likely to increase the present value of their holdings from enrollment, throughout the rest of the population, similarities among enrollees and nonenrollees with respect to age are common. One reason for this phenomenon is the fact that the vast majority of nonenrollees from ages 35 to 65 have nonfarm incomes in excess of 50% of their incomes. Thus, it seems that the disparity between predicted and observed behavior is due to the fact that middle aged landowners were less likely to benefit financially from enrollment than expected.

#### 6.2.5 Purpose

As outlined in the preceding chapter, a greater proportion of nonenrollees were seen to hold their land for lease to others than enrollees. Since these landowners typically earned a large proportion of their income off the farm, enrollment may not have increased the present value of their holdings. Also, a cross tabulation of this variable and reason for not enrolling revealed that the vast majority of those who lease their land for farming did not enroll because they were unaware of the program. Program enrollment can be expected to increase with increased awareness among this type of landowner.

#### 6.2.6 Motivation

The observed pattern of behavior with respect to one's motivation for acquiring land is consistent with the behavioral model as well. Within this model it appears that those who hold their land for residential or investment purposes were not able to enhance the present value of their holdings from enrollment in the act. While no definite pattern emerged for the reasons given for nonenrollment among those who listed 'investment' for purpose, the most common response among those who listed 'residential' was 'didn't know about the program.' So, as above, it can be concluded that landowners who hold their property for reasons other than farming may be able to increase the present value of their holdings through enrollment, assuming, of course, that they qualify.

#### 6.2.7 Type of Operation

Although this characteristic was not anticipated to be related to program enrollment, the survey results suggest that certain factors within the investment framework act to differentiate these groups. As mentioned in the preceding chapter, divergencies in behavior, specifically among beef, hogs, and dairy operations exist. First, it appears that the land requirements of beef and dairy

operations result in higher property taxes, and hence higher present values from enrollment. Strangely, both household and nonfarm incomes tended to be similar among all of these types. Since hog farms were located far from urban areas, it can be hypothesized that their owners are less likely to be affected by the costs of urban expansion. As a result, they may have had less incentive to enroll.

#### 6.2.8 Length of Ownership

Behavior among enrollees and nonenrollees is consistent with the investment framework as well. While the level of significance is not as great for this characteristic as for the others, it appears that the present values of landowners which have owned their land for longer periods of time are enhanced by enrollment. Still, a breakdown of these groups by nonfarm income yields interesting results. When this variable is used as a control, the level of significance increases to .1479, suggesting that the relationship between enrollment and the length that the land was held is less clear. So, as with age, it can be concluded that income earned off farm may have affected the amount of tax credit which could have been gained from these nonenrollees.

#### 6.2.9 Acreage

As alluded to above, enrollment appears to benefit landowners with larger holdings, since property taxes are usually higher for this group. Within the investment framework, decreases in expenses - namely property taxes, are great enough to enhance the present value of these owners' holdings. And when nonfarm income is held constant as above, the level of significance becomes lower, to .0054. Pecuniary factors can be considered important in the decision not to enroll, since, as mentioned in the previous chapter, a significant number of nonenrollees with holdings greater than 120 acres claimed that they didn't enroll because they "wanted to keep development options open." In general, the

association between size of holding and enrollment which was originally hypothesized is confirmed.

#### 6.3.10 Development Expectations

Since the expectation of future development tends to increase the present value of one's property, it appears that such expectations will act to enhance this measure to a greater degree than the benefits which would be anticipated from enrollment in the program. And given that a strong relationship existed between location and development expectations, the anticipation of future benefit appears to be warranted. For this, it is obvious that the behavioral model is supported by the results of the survey.

## CHAPTER 7

### CONCLUSIONS AND POLICY RECOMMENDATIONS

Analysis made in the preceding chapters suggests that response to the Michigan Farmland and Open Space Preservation Act is related to three principal factors: landowner characteristics, the economic viability of one's property, and landowner expectations. While economic considerations were found to be important factors in the enrollment decision of landowners in the study area, conclusions regarding the impact of economic benefits, such as tax credits which accrue from enrollment, on land use behavior, are less clear.

Among enrollees, commitment to the provisions of the act appears to be strong as nearly three-quarters of those responding claimed that they would not sell their land upon receiving an attractive offer. However, when this same group was asked the amount of tax credit which would be necessary in excess of P.A. 116 to convince them not to sell their land, only half claimed that they had no intention of selling their land under any circumstances. These sentiments should increase doubts about actual commitment to the provisions of the act.

Similar intentions are revealed for future land use. Although two-thirds of the enrollees claimed that they would have retained their contract if its minimum length were increased to twenty years, few expressed the desire to preserve their land beyond its expected time to development. Thus, landowners appear to be committed to preserving open space only for the present.

What is the impact of the program on land use decisions? Since there is a significant relationship between purchases of land and enrollment, it can be hypothesized that the program has given landowners the opportunity to increase the size of their present holdings. However, since there is no significant difference between these groups' future plans to purchase land, no strong conclusion can be made regarding this hypothesis.

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Similarly, as noted in the previous chapter, the fact that significant differences existed among these groups for reasons for selling land, suggests that economic considerations play a less important role in decisionmaking among enrollees than nonenrollees - especially among those in regions of high development potential.

Lastly, while a significant portion of enrollees (77.1%) claimed that enrollment was "a major factor in their ability to maintain their present operation," a majority also claimed that they had no intention of selling their land under any circumstances. Thus, some doubt can be raised about the actual impact of the program on land use.

With respect to nonenrollees, this trend is supported by the fact that a significant number of landowners claimed that they would keep their land in its present use with only minimal economic incentives. While it can be assumed that some of these owners were unaware of the program, it is interesting to note that of those who claimed that they had no intention of changing their land use, an even split occurred between those who didn't know about the program and those who weren't interested in it. Thus, it can be hypothesized that increased awareness of the act would only affect half of those who already intend to preserve land.

Furthermore, it appears that no significant differences existed among enrollees and nonenrollees for reasons for not selling land. Indeed, a majority of landowners in both cases claimed that they had not sold land because they wanted to keep it in its present use.

To reiterate, 77.1% of enrollees felt that the act was a "major factor in the ability to continue their present operation." Furthermore, 62.7% of this same group claimed that it helped them make purchases for equipment and improvements. Taken alone, these results suggest that the program has been a



positive force enabling landowners to remain in farming. Nonetheless these facts must be balanced with the knowledge that a substantial number of enrollees claimed that they had no intention of selling their land in any case.

And while present landowner commitment to preserving open space appears to be strong, the longer-term outlook, however, is less sanguine, as only 4.3% of the enrollees contracted their land beyond its anticipated time of development.<sup>41</sup> Thus, a principal policy finding of this study is that the program has had (and probably will have) a limited impact on land use in the Lansing Area. Since many nonenrollees also appear to be committed to preserving land in its current form (at least for the present), this does not imply that prime farmlands will be lost in the near future.

The survey results also suggest that the sanctions associated with enrollment, specifically the use rights restrictions and lien, are a significant obstacle to increased participation. Finally, given that more than a third of nonenrollees claimed that a tax credit of 20% or less would be enough to prevent them from changing their current form of use, it can be conjectured that low enrollment in the area can be explained by poor publicity.

## **7.1 RECOMMENDATIONS AND AREAS OF FUTURE STUDY**

The preceding discussion indicates that enrollment can be enhanced with increased public awareness of the act. Since it has been shown that a significant number of nonenrollees are already committed to keeping their land in its current form, a campaign of this sort should be moderately successful.

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<sup>41</sup> This is not surprising since a majority of enrollees were between the ages of 45 and 64.

For this, a study of the enrollment process similar to Carman (1977) could be useful to determine which factors contribute to ignorance of the potential benefits of the act. Given that variations in enrollment can be explained by variations in expected net returns, the impact of increased awareness of features such as tax saving should also be examined.

Similarly, because many nonenrollees expressed dismay over the lengthiness of the application procedure as well as uncertainty concerning the program's use provisions, attempts to minimize potential transactions costs could be made. As suggested by Cochrane (1976), emphasis could be given to studies which examine the effect of the program's restrictions on the enrollment decision. Since it was hypothesized that increases in program sanctions would be related to low enrollment, future research could attempt to measure the effect of say, a shorter lien and/or freer use rights on enrollment. These findings could then be implemented into local land use policies, and their effect on preserving open space could be monitored.

Lastly, since it is apparent that the benefits of enrollment are diminished by high percentages of off-farm income, an exemption of a percentage of such income could be considered to increase enrollment. Indeed, many nonenrollees - typically part-time farmers, expressed the desire to preserve open space; however, as expected, their level of income prevented them from doing so. Thus, it would be interesting to determine the impact of a liberalization of the enrollment requirements on the program's long-term objectives.

## **7.2 LIMITATIONS OF THE STUDY**

Data limitations - most notably the small sample size of the population which was examined, requires that these conclusions and recommendations be qualified. Specifically, the crosstabulations of independent variables related to the enrollment decision revealed an abundance of "empty cells." Lastly, the unique

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characteristics of the type and size of operations which existed in the area of study may create difficulties for applying these findings to other areas within the state of Michigan.

The findings of this study then should be viewed as an indication of the type of behavior which results from a land preservation program of this type. For this, future analysts would be best advised to follow up the survey method of this study with a more qualitative approach, including direct personal or telephone interview with individual landowners and county extension agents.

APPENDIX A  
QUESTIONNAIRES

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ENROLLEE

**FARMLAND AND OPEN SPACE PRESERVATION STUDY  
DEPARTMENT OF AGRICULTURAL ECONOMICS  
MICHIGAN STATE UNIVERSITY**

**DIRECTIONS**

1. Please read each question carefully. Circle the appropriate letter(s) or fill in the blanks with your answers for each of the following questions.
2. Upon completing the questionnaire, return it as promptly as possible in the enclosed envelope. Your cooperation is greatly appreciated.

**YOUR RESPONSE WILL BE HELD IN STRICT CONFIDENCE**

**Demographics.**

1. In general, which of the following best describes the organization of your property?
  - a. family or individual
  - b. partnership (including family partnerships)
  - c. corporation
  - d. other, please specify.....
2. For what purpose is your land currently being held?
  - a. farming
  - b. lease to others
  - c. sale for future development
  - d. other, please specify.....
3. What was the motivation for acquiring your land?
  - a. farming
  - b. residential
  - c. investment
  - d. nonfarm development
  - e. other, please specify.....
- 3a. If farming, which of the following best describes your type of operation?

<ol style="list-style-type: none"><li>a. cash grains</li><li>b. feed grains</li><li>c. beef</li><li>d. hogs</li></ol>	<ol style="list-style-type: none"><li>e. dairy</li><li>f. fruit/vegetable</li><li>g. poultry</li><li>h. other, please specify .....</li></ol>
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4. How long have you owned your oldest enrolled tract of land?
  - a. less than 10 years
  - b. between 10 and 15 years
  - c. between 15 and 20 years
  - d. more than 20 years
5. How many acres do you currently own?
  - a. 1 - 20
  - b. 21 - 40
  - c. 41 - 80
  - d. 81 - 120
  - e. more than 120

6. What is your age?
  - a. under 25 years
  - b. 25 - 34
  - c. 35 - 44
  - d. 45 - 54
  - e. 55 - 64
  - f. 65 years and over
  
7. What was your household income (from all sources) in 1986?
 

a. 0 - \$10,000	e. 40,000 - \$60,000
b. 10,000 - \$20,000	f. 60,000 - \$80,000
c. 20,000 - \$30,000	g. 80,000 - \$100,000
d. 30,000 - \$40,000	h. over \$100,000
  
8. Of the above, what percentage would you estimate was earned from nonfarm sources?
  - a. 0 - 10%
  - b. 10 - 20%
  - c. 20 - 30%
  - d. 30 - 50%
  - e. over 50%

**Land Use**

9. How long before you expect your land (enrolled and nonenrolled) to be converted from agricultural to developed (nonagricultural) use?
  - a. less than ten years
  - b. between 10 and 15 years
  - c. between 15 and 20 years
  - d. more than 20 years
  - e. don't know
  
10. Have you sold any land from your total holdings in the past 15 years?
  - a. yes
  - b. no
  
- 10a. If yes, why?
  - a. to profit from a capital gain
  - b. because former use wasn't profitable
  - c. to allow son/daughter to live there
  - d. holding costs were too high
  - e. other, please specify.....
  
- 10b. If no, why not?
  - a. haven't received any offers
  - b. would sell, but price was too low
  - c. want to keep land in its present use
  - d. other, please specify.....
  
11. Have you purchased any land to add to your present holdings in the past 15 years?
  - a. yes
  - b. no

12. Do you have any plans to purchase land to add to your holdings in the next 10 years?

- a. yes
- b. no

13. Rank the following (1,2,3, etc) in terms of their importance in convincing you to enroll in the program.

- ..... Tax benefit
- ..... Love of farming
- ..... Protection of farm land
- ..... Protection of natural habitat
- ..... Not ready to develop
- ..... To avoid special assessment for infrastructure
- ..... To discourage purchase offers
- ..... Threat of urban expansion
- ..... Other, please specify .....

14. Is all of the land that you own currently under contract?

- a. yes
- b. no

14a. If no, why?

- a. to earn capital gains
- b. in order to sell a lot to a family member
- c. other, please specify.....

15. What is the length (in time) of your contract?

- a. 10 - 15 years
- b. 16 - 20 years
- c. 21 - 30 years
- d. 31 - 40 years
- e. over 40 years

16. Do you think that your participation in the program has helped you make purchases for equipment and/or improvements related to your operations?

- a. yes
- b. no

17. If the minimum contract length were 15 instead of 10 years, would you have enrolled your land in the program?

- a. yes
- b. no

18. If the minimum contract length were 20 years, would you have enrolled your land in the program?

- a. yes
- b. no

19. Is enrollment in the program a major factor in your ability to maintain your current operation?

- a. yes
- b. no

20. If you could break your enrollment contract upon receiving an attractive offer to sell your land, would you do so?

- a. yes
- b. no

21. If you are considering converting your land to some form of nonagricultural use (by either selling or developing it) after your current contract, how much greater would your tax credit under P.A. 116 have to be to influence you not to sell?

- a. wouldn't affect my decision
- b. 5%
- c. 7.5%
- d. 10%
- e. 25% or more, please specify .....
- f. have no intention to sell under any circumstances



NON -- ENROLLEE

**FARMLAND AND OPEN SPACE PRESERVATION STUDY  
DEPARTMENT OF AGRICULTURAL ECONOMICS  
MICHIGAN STATE UNIVERSITY**

**DIRECTIONS**

1. Please read each question carefully. Circle the appropriate letter(s) or fill in the blanks with your answers for each of the following questions.
2. Upon completing the questionnaire, return it as promptly as possible in the enclosed envelope. Your cooperation is greatly appreciated.

**YOUR RESPONSE WILL BE HELD IN STRICT CONFIDENCE**

**Demographics**

1. In general, which of the following best describes the organization of your property?
    - a. family or individual
    - b. partnership (including family partnerships)
    - c. corporation
    - d. other please specify .....
  2. For what purpose is your land currently being held?
    - a. farming
    - b. lease to others
    - c. sale for future development
    - d. other, please specify.....
  3. What was the motivation for acquiring your land?
    - a. farming
    - b. residential
    - c. investment
    - d. nonfarm development
    - e. other, please specify.....
  - 3a. If farming, which of the following best categorizes your type of operation?

a. cash grains	e. fruit/vegetable
b. beef	f. poultry
c. hogs	g. other, please specify
d. dairy	.....
  4. How long have you owned your oldest tract of land?
    - a. less than 10 years
    - b. between 10 and 15 years
    - c. between 15 and 20 years
    - d. more than 20 years
  5. How many acres do you currently own?
    - a. 1 - 9
    - b. 10 - 40
    - c. 41 - 80
    - d. 81 - 120
    - e. more than 120
-

6. What is your age?
  - a. under 25 years
  - b. 25 - 34
  - c. 35 - 44
  - d. 45 - 54
  - e. 55 - 64
  - f. 65 years and over
  
7. What was your household income (from all sources) in 1986?
 

a. 0 - \$10,000	e. 40,000 - \$60,000
b. 10,000 - \$20,000	f. 60,000 - \$80,000
c. 20,000 - \$30,000	g. 80,000 - \$100,000
d. 30,000 - \$40,000	h. over \$100,000
  
8. Of the above, what percentage would you estimate was earned from nonfarm sources?
  - a. 0 - 10%
  - b. 10 - 20%
  - c. 20 - 30%
  - d. 30 - 50%
  - e. over 50%

### Land Use

9. How long before you expect your land to be converted from agricultural to developed (nonagricultural) use?
  - a. less than ten years
  - b. between 10 and 15 years
  - c. between 15 and 20 years
  - d. more than 20 years
  - e. don't know
  
10. What percentage tax credit on your property would be necessary to influence you not to sell, or convert your land to nonagricultural use?
  - a. wouldn't affect my decision
  - b. 7%
  - c. 10%
  - d. 15%
  - e. 20%
  - f. 20% or more, please specify .....
  - g. have no intention to sell under any circumstances
  
11. Have you sold any land from your total holdings in the past 15 years?
  - a. yes
  - b. no
  
- 11a. If yes, why?
  - a. to profit from a capital gain
  - b. because former use wasn't profitable
  - c. to allow son/daughter to live there
  - d. holding costs were too high
  - e. other, please specify.....

11b. If no, why not?

- a. haven't received any offers
- b. would sell, but price was too low
- c. want to keep land in its present use
- d. other, please specify.....

12. Have you purchased any land to add to your present holdings in the past 15 years?

- a. yes
- b. no

13. Do you have any plans to purchase land to add to your holdings in the next 10 years?

- a. yes
- b. no

14. Which of the following best describes your reason for not enrolling in P.A. 116?

- a. didn't know about the program
- b. didn't qualify
- c. didn't benefit enough
- d. wasn't interested
- e. want to keep development alternatives open
- f. other, please specify.....

APPENDIX B

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Table 1A: Household Income by Type of Operation, Enrollees

	IF FARMING, WHAT TYPE						Total
	CASH GRAINS	FEED GRAINS	BEEF	DAIRY	FRUIT/ VEGETA BLE	OTHER	
HOUSEHOLD INCOME							
0-\$10,000	5 11.4%	1 50.0%	1 20.0%			1 20.0%	8 11.6%
10,000-\$20,000	16 36.4%	1 50.0%	2 40.0%	3 27.3%			22 31.9%
20,000-\$30,000	5 11.4%			3 27.3%	1 50.0%	2 40.0%	11 15.9%
30,000-\$40,000	10 22.7%			2 18.2%		1 20.0%	13 18.8%
40,000-\$60,000	4 9.1%		2 40.0%	1 9.1%		1 20.0%	8 11.6%
60,000-\$80,000	2 4.5%			2 18.2%			4 5.8%
80,000-\$100,000					1 50.0%		1 1.4%
>\$100,000	2 4.5%						2 2.9%
<b>Total</b>	<b>41 63.8%</b>	<b>2 2.9%</b>	<b>5 7.2%</b>	<b>11 15.9%</b>	<b>2 2.9%</b>	<b>5 7.2%</b>	<b>69 100.0%</b>

Table 2A: Nonfarm Income by Type of Operation, Enrollees

	IF FARMING, WHAT TYPE						Total
	CASH GRAINS	FEED GRAINS	BEEF	DAIRY	FRUIT/ VEGETA BLE	OTHER	
NONFARM INCOME							
0-10%	12 25.0%		3 60.0%	7 63.6%	1 50.0%	1 20.0%	24 32.9%
10-20%	4 8.3%			1 9.1%		1 20.0%	6 8.2%
20-30%	2 4.2%			1 9.1%			3 4.1%
30-50%	5 10.4%	1 50.0%		1 9.1%		1 20.0%	8 11.0%
>50%	25 52.1%	1 50.0%	2 40.0%	1 9.1%	1 50.0%	2 40.0%	32 43.8%
Total	48 65.8%	2 2.7%	5 6.8%	11 15.1%	2 2.7%	5 6.8%	73 100.0%

Table 3A: Nonfarm Income by Length of Ownership, Enrollees

	LENGTH OF OWNERSHIP				Total
	< 10 YEARS	BETWEEN 10 AND 15 YEARS	BETWEEN 15 AND 20 YEARS	> 20 YEARS	
<b>NONFARM INCOME</b>					
0-10%	2 28.6%	2 66.7%	6 46.2%	14 29.2%	24 33.8%
10-20%			1 7.7%	4 8.3%	5 7.0%
20-30%				3 6.3%	3 4.2%
30-50%			1 7.7%	7 14.6%	8 11.3%
>50%	5 71.4%	1 33.3%	5 38.5%	20 41.7%	31 43.7%
<b>Total</b>	7 9.9%	3 4.2%	13 18.3%	48 67.6%	71 100.0%

Table 4A: Nonfarm Income by Purpose, Enrollees

	PURPOSE			Total
	FARMING	LEASE TO OTHERS	SALE FOR FUTURE DEVELOPMENT	
NONFARM INCOME				
0-10%	23 33.8%		1 50.0%	24 32.9%
10-20%	6 8.8%			6 8.2%
20-30%	3 4.4%			3 4.1%
30-50%	8 11.8%			8 11.0%
>50%	28 41.2%	3 100.0%	1 50.0%	32 43.8%
Total	68 93.2%	3 4.1%	2 2.7%	73 100.0%



Table 5A: Nonfarm Income by Motivation, Enrollees

	MOTIVATION				Total
	FARMING	RESIDENT IAL	INVESTME NT	OTHER	
NONFARM INCOME 0-10%	24 35.3%				24 32.9%
10-20%	5 7.4%		1 50.0%		6 8.2%
20-30%	3 4.4%				3 4.1%
30-50%	8 11.8%				8 11.0%
>50%	28 41.2%	1 100.0%	1 50.0%	2 100.0%	32 43.8%
Total	68 93.2%	1 1.4%	2 2.7%	2 2.7%	73 100.0%

Table 6A: Nonfarm Income by Acreage, Enrollees

	ACREAGE				Total
	21-40 ACRES	41-80 ACRES	81-120 ACRES	>120 ACRES	
<b>NONFARM INCOME</b>					
0-10%		1 25.0%	2 18.2%	21 38.2%	24 33.3%
10-20%		1 25.0%	1 9.1%	3 5.5%	5 6.9%
20-30%			1 9.1%	2 3.6%	3 4.2%
30-50%			1 9.1%	7 12.7%	8 11.1%
>50%	2 100.0%	2 50.0%	6 54.5%	22 40.0%	32 44.4%
<b>Total</b>	2 2.8%	4 5.6%	11 15.3%	55 76.4%	72 100.0%

Table 7A: Age by Length of Ownership, Enrollees

	LENGTH OF OWNERSHIP				Total
	< 10 YEARS	BETWEEN 10 AND 15 YEARS	BETWEEN 15 AND 20 YEARS	> 20 YEARS	
<b>AGE</b>					
25-34	1 14.3%	1 33.3%		1 1.9%	3 4.0%
35-44	2 28.6%	1 33.3%	1 7.7%	4 7.7%	8 10.7%
45-54	1 14.3%		8 61.5%	9 17.3%	18 24.0%
55-64	2 28.6%	1 33.3%	3 23.1%	17 32.7%	23 30.7%
65 AND OLDER	1 14.3%		1 7.7%	21 40.4%	23 30.7%
<b>Total</b>	7 9.3%	3 4.0%	13 17.3%	52 69.3%	75 100.0%

Table 8A: Age by Acreage, Enrollees

	ACREAGE				Total
	21-40 ACRES	41-80 ACRES	81-120 ACRES	>120 ACRES	
AGE					
25-34			1 7.7%	2 3.5%	3 3.9%
35-44			1 7.7%	7 12.3%	8 10.5%
45-54			2 15.4%	16 28.1%	18 23.7%
55-64		2 50.0%	3 23.1%	19 33.3%	24 31.6%
65 AND OLDER	2 100.0%	2 50.0%	6 46.2%	13 22.8%	23 30.3%
Total	2 100.0%	4 100.0%	13 100.0%	57 100.0%	76 100.0%

Table 9A: Age by Nonfarm Income, Enrollees

	NONFARM INCOME					Total
	0-10%	10-20%	20-30%	30-50%	>50%	
E						
-34	1 4.2%				2 6.3%	3 4.1%
-44	2 8.3%	3 50.0%		1 12.5%	3 9.4%	9 12.3%
-54	8 33.3%		1 33.3%	2 25.0%	6 18.8%	17 23.3%
-64	10 41.7%	2 33.3%	1 33.3%	2 25.0%	9 28.1%	24 32.9%
AND OLDER	3 12.5%	1 16.7%	1 33.3%	3 37.5%	12 37.5%	20 27.4%
tal	24 32.9%	6 8.2%	3 4.1%	8 11.0%	32 43.8%	73 100.0%

Table 10A: Motivation by Development Potential, Enrollees

	DEVELOPMENT POTENTIAL		Total
	HIGH DEVELOPEMENT	LOW DEVELOPEMENT	
MOTIVATION FARMING	42 91.3%	30 96.8%	72 93.5%
RESIDENTIAL	1 2.2%		1 1.3%
INVESTMENT	2 4.3%		2 2.6%
OTHER	1 2.2%	1 3.2%	2 2.6%
Total	46 100.0%	31 100.0%	77 100.0%

Table 11A: Type of Operation by Development Potential, Enrollees

	DEVELOPMENT POTENTIAL		Total
	HIGH DEVELOPMENT	LOW DEVELOPMENT	
IF FARMING, WHAT TYPE			
CASH GRAINS	30 65.2%	21 67.7%	51 66.2%
FEED GRAINS	1 2.2%	1 3.2%	2 2.6%
BEEF	5 10.9%		5 6.5%
DAIRY	4 8.7%	7 22.6%	11 14.3%
FRUIT/VEGETABLE	1 2.2%	1 3.2%	2 2.6%
OTHER	5 10.9%	1 3.2%	6 7.8%
<b>Total</b>	46 59.7%	31 40.3%	77 100.0%

Table 12A: Length of Ownership by Acreage, Enrollees

	ACREAGE				Total
	21-40 ACRES	41-80 ACRES	81-120 ACRES	>120 ACRES	
LENGTH OF OWNERSHIP < 10 YEARS	1 50.0%		3 23.1%	3 5.3%	7 9.3%
BETWEEN 10 AND 15 YEARS				3 5.3%	3 4.0%
BETWEEN 15 AND 20 YEARS			2 15.4%	11 19.3%	13 17.3%
> 20 YEARS	1 50.0%	3 100.0%	8 61.5%	40 70.2%	52 69.3%
Total	2 2.7%	3 4.0%	13 17.3%	57 76.0%	75 100.0%



Table 13A: Acreage by Type of Operation, Enrollees

	IF FARMING, WHAT TYPE						Total
	CASH GRAINS	FEED GRAINS	BEEF	DAIRY	FRUIT/VE GETABLE	OTHER	
REAGE							
-40 ACRES	1 2.0%		1 20.0%				2 2.6%
-80 ACRES	2 4.0%					2 33.3%	4 5.3%
-120 ACRES	9 18.0%		1 20.0%			3 50.0%	13 17.1%
20 ACRES	38 76.0%	2 100.0%	3 60.0%	11 100.0%	2 100.0%	1 16.7%	57 75.0%
otal	50 65.8%	2 2.6%	5 6.6%	11 14.5%	2 2.6%	6 7.9%	76 100.0%

Table 14A: Expectations by Development Potential, Enrollees

	DEVELOPMENT POTENTIAL		Total
	HIGH DEVELOPMENT	LOW DEVELOPMENT	
DEVELOPMENT EXPECTATIONS BETWEEN 10-15 YEARS	7 15.2%		7 9.1%
BETWEEN 15-20 YEARS	1 2.2%	1 3.2%	2 2.6%
MORE THAN 20 YEARS	15 32.6%	15 48.4%	30 39.0%
DON'T KNOW	23 50.0%	15 48.4%	38 49.4%
Total	46 59.7%	31 40.3%	77 100.0%

Table 15A: Household Income by Type of Operation, Nonenrollees

	IF FARMING, WHAT TYPE OF OPERATION					Total
	CASH GRAINS	FEED GRAINS	HOGS	POULTRY	OTHER	
HOUSEHOLD INCOME						
0-\$10,000	1 2.1%		2 33.3%			3 4.7%
10,000-\$20,000	12 25.5%	1 16.7%		1 100.0%		14 21.9%
20,000-\$30,000	7 14.9%	1 16.7%	1 16.7%		1 25.0%	10 15.6%
30,000-\$40,000	9 19.1%		2 33.3%		1 25.0%	12 18.8%
40,000-\$60,000	10 21.3%	3 50.0%	1 16.7%			14 21.9%
60,000-\$80,000	4 8.5%				1 25.0%	5 7.8%
80,000-\$100,000	1 2.1%	1 16.7%				2 3.1%
>\$100,000	3 6.4%				1 25.0%	4 6.3%
Total	47 73.4%	6 9.4%	6 9.4%	1 1.6%	4 6.3%	64 100.0%

Table 16A: Nonfarm Income by Type of Operation, Nonenrollees

	IF FARMING, WHAT TYPE OF OPERATION					Total
	CASH GRAINS	FEED GRAINS	HOGS	POULTR Y	OTHER	
NON FARM INCOME						
0-10%	7 14.3%		4 66.7%		1 25.0%	12 18.2%
10-20%	5 10.2%	1 16.7%				6 9.1%
20-30%	1 2.0%		1 16.7%			2 3.0%
30-50%	1 2.0%		1 16.7%			2 3.0%
>50%	35 71.4%	5 83.3%		1 100.0%	3 75.0%	44 66.7%
Total	49 74.2%	6 9.1%	6 9.1%	1 1.5%	4 6.1%	66 100.0%

Table 17A: Nonfarm Income by Length of Ownership, Nonenrollees

	LENGTH OF OWNERSHIP				Total
	< 10 YEARS	BETWEEN 10 AND 15 YEARS	BETWEEN 15 AND 20 YEARS	MORE THAN 20 YEARS	
NON FARM INCOME					
0-10%			1 14.3%	11 23.4%	12 17.1%
10-20%		1 9.1%	1 14.3%	5 10.6%	7 10.0%
20-30%				2 4.3%	2 2.9%
30-50%				2 4.3%	2 2.9%
>50%	5 100.0%	10 90.9%	5 71.4%	27 57.4%	47 67.1%
Total	5 7.1%	11 15.7%	7 10.0%	47 67.1%	70 100.0%

Table 18A: Nonfarm Income by Purpose, Nonenrollees

	PURPOSE FOR HOLDING LAND				Total
	FARMING	LEASE TO OTHERS	SALE FOR FUTURE DEVELOPMENT	OTHER	
<b>NON FARM INCOME</b>					
0-10%	10 21.3%	1 6.7%	1 33.3%		12 17.1%
10-20%	5 10.6%	1 6.7%	1 33.3%		7 10.0%
20-30%	2 4.3%				2 2.9%
30-50%	2 4.3%				2 2.9%
>50%	28 59.6%	13 86.7%	1 33.3%	5 100.0%	47 67.1%
<b>Total</b>	47 67.1%	15 21.4%	3 4.3%	5 7.1%	70 100.0%

Table 19A: Nonfarm Income by Motivation, Nonenrollees

	MOTIVATION FOR ACQUIRING LAND					Total
	FARMING	RESIDENTIAL	INVESTMENT	NONFARM DEVELOPMENT	OTHER	
NON FARM INCOME						
0-10%	10 20.4%	1 7.7%	1 16.7%			12 17.1%
10-20%	6 12.2%			1 100.0%		7 10.0%
20-30%	2 4.1%					2 2.9%
30-50%	2 4.1%					2 2.9%
>50%	29 59.2%	12 92.3%	5 83.3%		1 100.0%	47 67.1%
Total	49 70.0%	13 18.6%	6 8.6%	1 1.4%	1 1.4%	70 100.0%

Table 23A: Nonfarm Income by Acreage, Nonenrollees

	ACREAGE				Total
	10-40 ACRES	41-80 ACRES	81-120 ACRES	>120 ACRES	
NON FARM INCOME					
0-10%	2 33.00	1 5.00	2 10.00	7 25.00	12 73.00
10-20%		3 15.00		4 15.00	7 30.00
20-30%		1 5.00	1 5.00		2 10.00
30-50%				2 7.00	2 14.00
50%	2 26.75	1 10.00	16 64.00	14 51.00	33 151.75
Total	4 8.00	5 25.00	19 75.00	27 98.00	55 206.00



Table 21A: Age by Length of Ownership, Nonenrollees

	LENGTH OF OWNERSHIP				Total
	< 10 YEARS	BETWEEN 10 AND 15 YEARS	BETWEEN 15 AND 20 YEARS	MORE THAN 20 YEARS	
AGE					
25-34	2 40.0%			1 1.9%	3 4.0%
35-44	1 20.0%	5 45.5%	1 14.3%	3 5.8%	10 13.3%
45-54	2 40.0%	2 18.2%	5 71.4%	2 3.8%	11 14.7%
55-64		4 36.4%		15 28.8%	19 25.3%
>65			1 14.3%	31 59.6%	32 42.7%
Total	5 6.7%	11 14.7%	7 9.3%	52 69.3%	75 100.0%

Table 22A: Age by Acreage, Nonenrollees

	ACREAGE				Total
	10-40 ACRES	41-80 ACRES	81-120 ACRES	>120 ACRES	
<b>AGE</b>					
25-34	2 33.3%			1 3.6%	3 4.0%
35-44		2 9.1%	3 15.8%	5 17.9%	10 13.3%
45-54	1 16.7%	3 13.6%	4 21.1%	3 10.7%	11 14.7%
55-64	2 33.3%	3 13.6%	3 15.8%	11 39.3%	19 25.3%
>65	1 16.7%	14 63.6%	9 47.4%	8 28.6%	32 42.7%
<b>Total</b>	6 8.0%	22 29.3%	19 25.3%	28 37.3%	75 100.0%

Table 23A: Age by Nonfarm Income, Nonenrollees

	NON FARM INCOME					Total
	0-10%	10-20%	20-30%	30-50%	>50%	
E						
-34	1 8.3%				2 4.3%	3 4.3%
-44	2 16.7%				8 17.0%	10 14.3%
-54	1 8.3%	1 14.3%			9 19.1%	11 15.7%
-64	3 25.0%	2 28.6%	1 50.0%	1 50.0%	10 21.3%	17 24.3%
5	5 41.7%	4 57.1%	1 50.0%	1 50.0%	18 38.3%	29 41.4%
tal	12 17.1%	7 10.0%	2 2.9%	2 2.9%	47 67.1%	70 100.0%

Table 24A: Motivation by Development Potential, Nonenrollees

	POTENTIAL DEVELOPMENT		Total
	HIGH DEVELOPMENT	LOW DEVELOPMENT	
MOTIVATION FOR ACQUIRING LAND FARMING	27 62.8%	27 84.4%	54 72.0%
RESIDENTIAL	11 25.6%	2 6.3%	13 17.3%
INVESTMENT	4 9.3%	2 6.3%	6 8.0%
NONFARM DEVELOPMENT	1 2.3%		1 1.3%
OTHER		1 3.1%	1 1.3%
Total	43 57.3%	32 42.7%	75 100.0%

Table 25A: Type of Operation by Development Potential, Nonenrollees

	POTENTIAL DEVELOPMENT		Total
	HIGH DEVELOPMENT	LOW DEVELOPMENT	
IF FARMING, WHAT TYPE OF OPERATION			
CASH GRAINS	29 74.4%	25 78.1%	54 76.1%
FEED GRAINS	2 5.1%	4 12.5%	6 8.5%
HOGS	3 7.7%	3 9.4%	6 8.5%
POULTRY	1 2.6%		1 1.4%
OTHER	4 10.3%		4 5.6%
Total	39 54.9%	32 45.1%	71 100.0%

Table 26A: Length of Ownership by Acreage, Nonenrollees

	ACREAGE				Total
	10-40 ACRES	41-80 ACRES	81-120 ACRES	>120 ACRES	
LENGTH OF OWNERSHIP < 10 YEARS	2 33.3%		2 10.5%	1 3.6%	5 6.7%
BETWEEN 10 AND 15 YEARS	2 33.3%	3 13.6%	2 10.5%	4 14.3%	11 14.7%
BETWEEN 15 AND 20 YEARS		2 9.1%	4 21.1%	1 3.6%	7 9.3%
MORE THAN 20 YEARS	2 33.3%	17 77.3%	11 57.9%	22 78.6%	52 69.3%
<b>Total</b>	6 8.0%	22 29.3%	19 25.3%	28 37.3%	75 100.0%

Table 27A: Acreage by Type of Operation, Nonenrollees

	IF FARMING, WHAT TYPE OF OPERATION					Total
	CASH GRAINS	FEED GRAINS	HOGS	POULTRY	OTHER	
<b>ACREAGE</b>						
10-40 ACRES	5 9.3%					5 7.0%
41-80 ACRES	19 35.2%	2 33.3%				21 29.6%
81-120 ACRES	15 27.8%	1 16.7%	1 16.7%	1 100.0%	1 25.0%	19 26.8%
>120 ACRES	15 27.8%	3 50.0%	5 83.3%		3 75.0%	26 36.6%
<b>Total</b>	54 76.1%	6 8.5%	6 8.5%	1 1.4%	4 5.6%	71 100.0%

Table 28A: Expectations by Development Potential, Nonenrollees

	POTENTIAL DEVELOPMENT		Total
	HIGH DEVELOPMENT	LOW DEVELOPMENT	
DEVELOPMENT EXPECTATIONS			
<10 YEARS	9 20.9%	2 6.3%	11 14.7%
BETWEEN 10 AND 15 YEARS	8 18.6%	1 3.1%	9 12.0%
BETWEEN 15 AND 20 YEARS	3 7.0%		3 4.0%
>20 YEARS	8 18.6%	9 28.1%	17 22.7%
DON'T KNOW	15 34.9%	20 62.5%	35 46.7%
Total	43 57.3%	32 42.7%	75 100.0%



Table 29A: Expectations by Length of Contract, Enrollees

	LENGTH OF CURRENT CONTRACT					Total
	10-15 YEARS	16-20 YEARS	21-30 YEARS	31-40 YEARS	>40 YEARS	
DEVELOPMENT EXPECTATIONS BETWEEN 10-15 YEARS	3 7.0%	1 9.1%	1 16.7%	1 25.0%		6 8.6%
BETWEEN 15-20 YEARS	1 2.3%		1 16.7%			2 2.9%
MORE THAN 20 YEARS	19 44.2%	5 45.5%	1 16.7%	1 25.0%	3 50.0%	29 41.4%
DON'T KNOW	20 46.5%	5 45.5%	3 50.0%	2 50.0%	3 50.0%	33 47.1%
<b>Total</b>	43 61.4%	11 15.7%	6 8.6%	4 5.7%	6 8.6%	70 100.0%

Table 30A: Expectations by Acceptance of Longer Contract, Enrollees

	IF 20, WOULD YOU ENROLL		Total
	YES	NO	
DEVELOPMENT EXPECTATIONS BETWEEN 10-15 YEARS	2 4.5%	4 18.2%	6 9.1%
BETWEEN 15-20 YEARS		2 9.1%	2 3.0%
MORE THAN 20 YEARS	22 50.0%	7 31.8%	29 43.9%
DON'T KNOW	20 45.5%	9 40.9%	29 40.9%
Total	44 66.7%	22 33.3%	66 100.0%

APPENDIX C  
BIBLIOGRAPHY

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