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Agricultural land use policy: The Michigan Farmland and Open Space Preservation Act of 1974 (PA 116)

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AGRICULTURAL LAND USE POLICY: THE MICHIGAN FARMLAND AND OPEN SPACE PRESERVATION ACT OF 1974 (PA 116)

By

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ABSTRACT

AGRICULTURAL LAND USE POLICY: THE MICHIGAN FARMLAND AND OPEN SPACE PRESERVATION ACT OF 1974 (PA 116)

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The Michigan Farmland and Open Space Preservation Act of 1974, or PA 116, provides property tax relief to protect farmland in urban fringe areas from being converted to non-agricultural use. After about the first 10 years of the program, enrollment declined. Overall, enrollment near urban areas never achieved expected levels.

Analysis on the effectiveness of PA 116 in achieving its overall objectives has focused only on the number of acres enrolled and participating counties. This study defines the effectiveness of PA 116 in terms of the reduction of urban sprawl into agricultural areas. Effectiveness is measured by the rate of enrollment in the program in more urban counties.

The research design consists of descriptive analysis. Correlations and a cumulative adoption model serve as techniques for the analysis. The principal findings of this study are: (1) The initial increase in enrollment tended to fade statewide after 1978. The average real values of land per acre, PA 116 credits, contracts and acres enrolled dropped before the first 10 year minimum length of a

contract. (2) At the county level, the Thumb area and the southern part of Michigan led in enrollment. PA 116 credits have not been competitive with land market prices in urban counties. Early termination of contracts took place because of attractive land market prices, insufficient incentives, financial hardship, and the lack of information.

The main conclusions of this study are: (1) PA 116 credits were not successfully used to reduce urban sprawl; (2) The rigid enforcement of the program leads to early termination of contracts in areas of potential economic growth; and (3) The continuation of urban sprawl is due to insufficient incentives and the lack of special treatment of farmers in urban fringe areas.

Measures to revamp the program might include (1) give preferential treatment to farmers in urban areas and (2) reduce the minimum period farmers have to stay in the program. Future research needs include (1) the cost of the program to the State, and (2) the willingness of farmers to remain in farming activities.

To my wife Marie Mayoya

and to our children:

- Diane Nancy Ngabire;
- Juste Eric Munezero; and
- Those to come.

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PREFACE

In my country of Burundi, located in eastern-central Africa, about 90 percent of the total population is rural and agriculture accounts for almost 60 percent of the Gross Domestic Product. Coffee exports provide about 85 percent of the country's foreign exchange earnings (Stratégies, 1992). The average farm size per household was 1.7 hectares in 1980 and it is projected to drop to 1.1 hectare in 1995 and 0.7 hectares by 2010 (n.d., 1982). With an annual population growth rate of 3.2 percent (Population Reference Bureau, 1990), the demand for agricultural land in Burundi is extremely high.

Under these conditions, a consideration of measures such as property tax relief, as in the State of Michigan, to prevent farmland from conversion to non-agricultural uses would appear unnecessary. As the rate of urbanization increases, however, it is clear that government planners will confront a series of land use issues. This study, therefore, was undertaken to provide some analytic skills that might improve my ability to assist with the preservation and stewardship of scarce resources, such as land, in Burundi.

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CHAPTER I. INTRODUCTION

Land use policies are necessary for an orderly use of land resources. The extension of cities appreciates farmland values, which, in turn, increases property taxes, especially in urban fringe areas. The property tax burden on farmers accelerates agricultural land conversion to non-agricultural use. Real property taxes are assessed on the basis of highest and best use of the land. As such, land located near urban areas is subject to higher assessments than rural land. Moreover, property taxes are paid out of current income. Therefore, the increased property tax burden faced by farmers in urban fringe areas reduces their farm income. Higher property taxes, in turn, contribute to further urban sprawl, or to land conversion. Under these conditions, farmland protection programs are necessary to slow down land conversion.

This chapter discusses the importance of examining farmland protection program in Michigan. Following a brief review of the background of PA 116, the main lines of the continuing debate over this legislation are identified. Given the continued significance of PA 116 in agricultural land use policy in Michigan, an analysis of PA 116 is proposed as a means of generating information which might inform State land use policy-makers and planners.

I.1. Problem Statement

The Michigan Farmland and Open Space Preservation Act of 1974, or PA 116, provides property tax relief to protect farmland in urban fringe areas from being converted to non-agricultural uses. When PA 116 was passed, many were concerned that Michigan's agricultural and open space land was rapidly disappearing. Agricultural land in metropolitan fringe areas, also called interstitial rural areas, in Mid-Michigan, was being ever more pressed by metropolitan expansion in late 1970s (Dorow, M.G., 1983). Barlowe (1971) forecasted that farmland in southern Michigan would be islands by 1990 because of urbanization (see Map 1). The Bureau of Programs and Budget (1972) in the State of Michigan also projected that agricultural belt in southern Michigan will continue to shrink as the sprawl pattern associated with the Great Lakes megalopolis area and the area's transportation networks grew[1]. The Bureau predicted

[1] Interstate highways, like I-69, US-23, US-27 and US-31, were to be built or expanded by mid 1980s. Some other local highways, such as M-24 (Lapeer and Tuscola), M-44 (Kent), M-45 (Ottawa), M-53 (Macomb), M-60 (Cass), and M-66 (Montcalm), were being built or expected to be built in 1970s. Two airports were projected to be built at Caseville (Huron) and Marshall (Calhoun) in mid 1980s. The capital city airport was expected to be expanded late 1970s (Ayers, G., 1992).

that a basic Detroit to Benton Harbor urban corridor with extensions north to Grand Rapids and Muskegon and to Midland / Bay and Saginaw would exist by 1990[2].

The increase in agricultural property taxes, brought about by urban and suburban development pressure, was primarily responsible for the conversion of farmland to non-farm uses. Gardner and Barlowe (1978) found that property taxes per acre of farmland in Michigan increased by 287 percent during the 14 year period from 1962 to 1976, or about 20 percent increase each year. As the Michigan Department of Natural Resources (n.d.) stated, some farmers who wished to maintain their land undeveloped could not afford to do so. At the same time, property taxes for non-farmers were about one-fifth those of farmers. The Michigan Farmland and Open Space Preservation Act (PA 116) was therefore seen as a way to help ease the farm tax burden and thereby encourage farmers, especially those in or near urban areas, to preserve their land for agricultural use or as open space.

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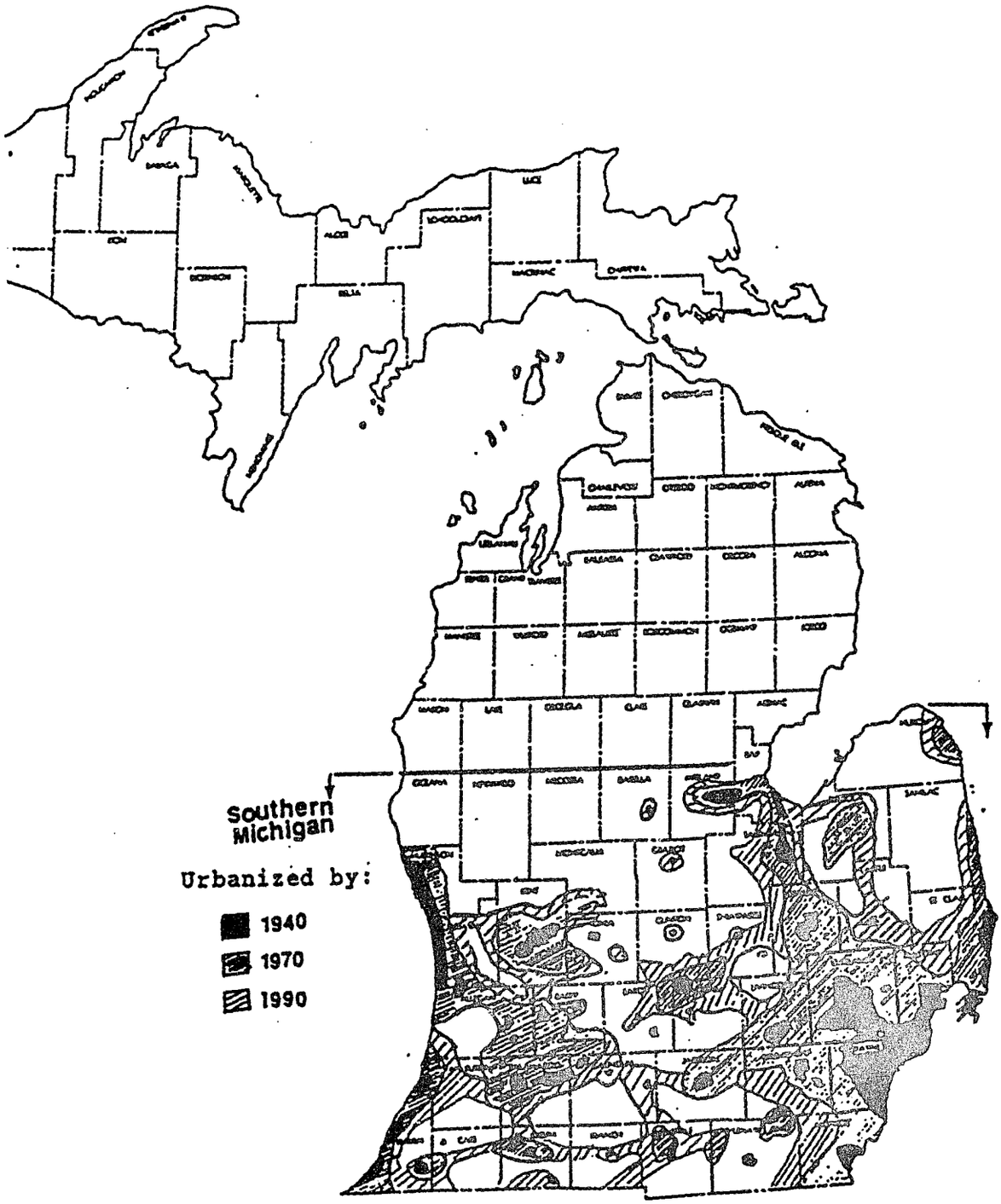
[2] During the 1978 Conference on Land Use Policy in Michigan, disorderly urban sprawl was seen as one of the main causes of land conversion to non-farm activities (Smith, R.E., 1978). Likewise, the President of the Developing Great Lakes Megalopolis Project predicted, around 1974, that farmland in the Great Lakes Basin would be a seaboard by year 2000 because of urban sprawl; and the Governor's Land Use Commission said that the movement from urban to farming areas created new demands for farmland, leading to higher taxes on farm properties, and, thus, to more land conversion.

Map 1 Trends in Urbanization in Southern Michigan, 1940-1990.



Source: Barlowe, R., 1971.

The Governor's Task Force on the Future of Agriculture suggested passage of tax legislation to preserve farmland because of the toll of urban sprawl. It was expected that farms located in urban fringe areas, where property taxes were rising, would be most attracted to such a program[3]. After 18 years, PA 116 is still a topic of political debate in the State of Michigan. One of the concerns of the PA 116 Working Group[4] is to alleviate frustrations encountered by farmers in both information dissemination and the enforcement of PA 116 (Hayes, M., 1992). Many farmers have not been aware of the negative consequences of early termination from the program. Information passed to farmers was not probably well understood, or farmers thought they were going to stay in farming activities forever. Some farmers expected their children to continue farming. They therefore overlooked provisions of PA 116, especially those related to early termination of contracts (Smith, R.E., 1992). Other concerns by farmers deal with measures that were not included in the Act, such as the requirements for

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[3] The Governor's Land Use Commission also suggested that special taxation arrangements should be implemented to alleviate tax problems caused by urbanization. Similarly, a 1971 Michigan State University Seminar on Taxation of Agriculture and Other Open Land suggested tax policies as a means to slow down agricultural land conversion to non-agricultural uses.

[4] The PA 116 Working Group comprises the Michigan Farm Bureau, a team led by Senator Nick Smith, and two other teams from the House of Representatives led by State Representatives Thomas Hickner and Margaret O'Connor.

construction of a residence for new family members on agricultural land enrolled in PA 116 (Hayes, M., 1992)[5].

The main problem of the farmland protection program in Michigan is, therefore, achieving the objective of preserving agricultural land, especially in urban fringe areas. Land use policy which protects agricultural land near urban areas from conversion remains an outstanding topic of political concern.

If agricultural land market prices are more attractive than incentives offered by the program, farmers may look for alternative investments, such as selling the farmland (or part of it), giving farming a lower priority. If, on the contrary, farmers perceive the program as a farm property tax relief (accounting for a relatively high percentage of total property taxes), it is expected that they would increase their participation in the program. The magnitude of PA 116 credits, with respect to farmland values, is a variable that needs to be included in the analysis of the effectiveness of the program.

Incentives, however, cannot be measured in terms of refunds to farmers alone. The exercise of property rights on the farmland is also part of the incentives to participate in the program. If farmers feel that their

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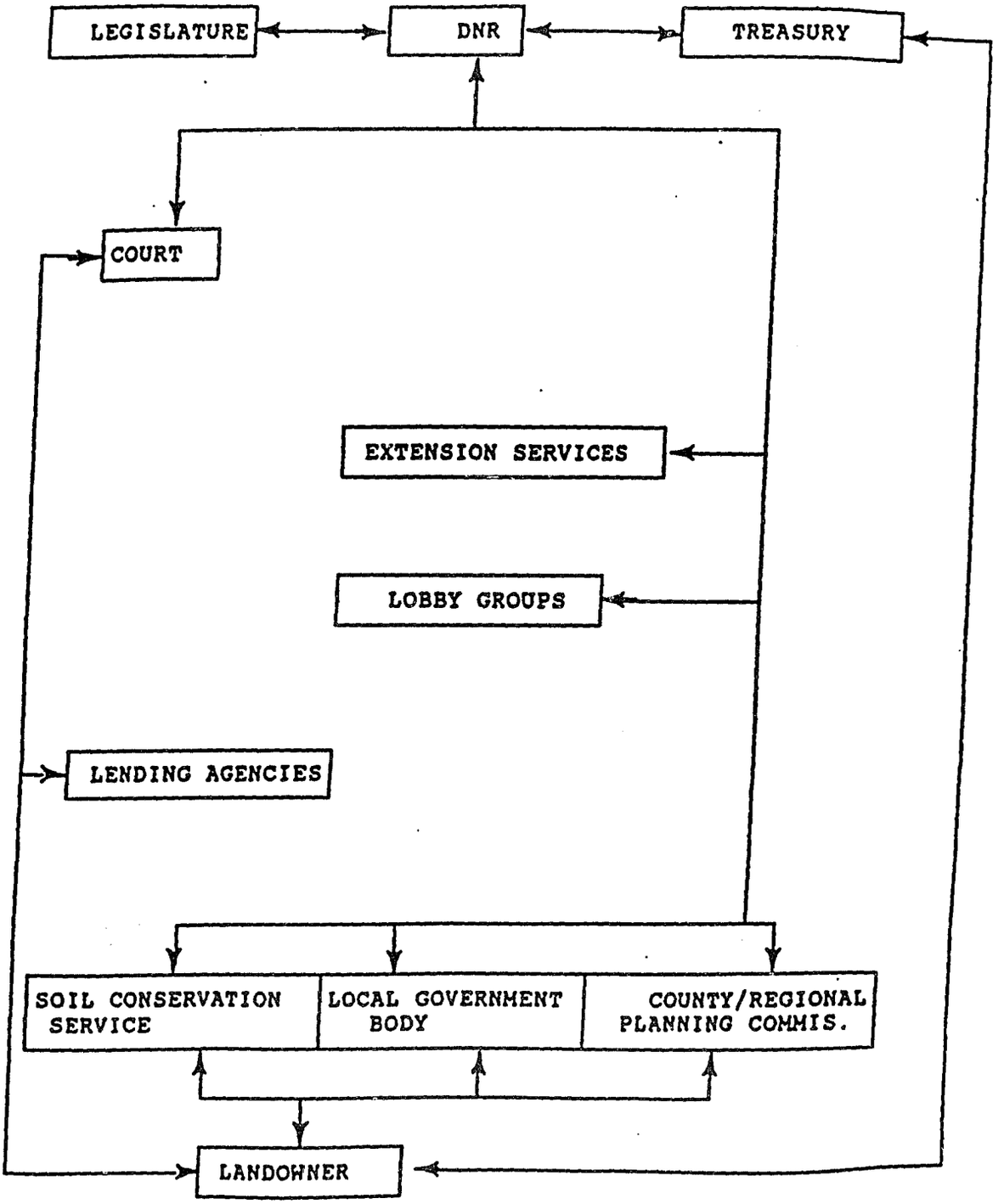
[5] Rural development which took place after PA 116 was enacted also encouraged developers to buy agricultural land for commercial, industrial, and residential purposes, creating thus further agricultural land conversion (Zeeb, V., 1992).

property rights on agricultural land are lost, as a result of the enforcement of the program, they may not participate. Strict control over the program (i.e., no adjustment to economic growth) can impede enrollment. Thus, the nature of the provisions of the program constitutes another variable to consider in analyzing enrollment in PA 116.

Consequently, the administration of PA 116 constitutes a variable that influences enrollment in or withdrawal from PA 116. The Michigan Department of Natural Resources (DNR) alone cannot successfully administer the program without a concerted action of various services which have a stake in farming, such as local governments, interest groups (e.g., Farm Bureau), and extension services (e.g., Michigan State University Extension Services) (see Chart 1). Thus, the performance of the program depends not only on monetary compensation to farmers, but also on its administration. The coordination of PA 116 among several governmental agencies and levels (including the way farmers were informed) is part of the administration of the program.

Chart 1 PA 116: Institutions Involved in Enrollment or Termination of Contracts



The geographic distribution of enrollment, along with agricultural land values, incentives and the control over PA 116 are some measures used to assess the effectiveness of the program. The potential rate of enrollment (the maximum acreage that can be enrolled with respect to land in farms in a given county) serves as an analytical technique to explain the patterns of enrollment, primarily in urban fringe areas.

The effectiveness of PA 116 in attracting farmers in urban fringe areas is the major issue in this dissertation. Effectiveness consists of the reduction of urban sprawl into agricultural areas in the State of Michigan. It is measured by the rate of enrollment in the program in more urban counties, resulting from incentives offered to landowners, as well as from the enforcement of the program (the level of the control over the program).

The rate of enrollment is the percentage of accumulated acreage enrolled with respect to the total acreage in farms (potential enrollment) per county in a given year. The rate of enrollment is also a result of incentives, such as PA 116 credits, that farmers get from the program. This rate is intended to be higher in more urban counties, where property taxes were a burden to farmers, than in more rural counties. Consequently, in order to be effective, PA 116 credits must

be competitive with farmland market prices and maintain farmers' freedom to exert property rights on their land.

I.2. Objectives of this Dissertation

The first objective of this study is to generate information about the effectiveness of PA 116 which might inform land use policy-makers and planners. This policy relevant information will be obtained from indepth analysis of enrollment and contract termination.

Specifically, the following research questions are explored at the state and county levels.

State level:

- Did accumulated contracts and acres enrolled increase?
- Did the average acreage per contract increase?
- Was enrollment affected by real farmland values?
- When did enrollment reach the saturation point?

County level:

- Where did enrollment take place?
- What was the rate of enrollment in more urban counties?
- Have PA 116 credits been competitive with land market prices, especially in urban counties?
- How have farmland values differed between counties?
- Where did early termination of contracts take place?
- Why did farmers terminate their contracts early?

The second objective of this study is to suggest policy changes that might improve the effectiveness of PA 116. The provisions of the program related to contract termination still act as a desincentive on enrollment (Hayes, M., 1992). Current amendments to PA 116 focus mainly on improving landowners'understanding of the program, with little change in the enforcement component and incentives (see Appendix 1).

I.3. Organization of this Dissertation

Chapter Two presents the conceptual framework for examining land use policy, especially PA 116, in the State of Michigan. This chapter develops the concept of land and tries to understand it in the broader context a threefold framework and a situation - structure - performance paradigm. Chapter Three reviews some of the major land use policies in the U.S. This chapter overviews the history of land use policies in the U.S., the types of programs to protect farmland, and issues raised by farmland protection. Chapter Four discusses land use policy and specifically the background to farmland protection programs in the State of Michigan. It covers the legislative history of farmland protection and the current debate on PA 116. The principal research questions to be addressed in the dissertation are

also presented. Chapter Five discusses the methods of analysis used in this study. Methods used in previous studies of PA 116 are reviewed. The data used in this study and the research design are presented. Chapter Six analytically describes patterns of enrollment and contract termination. Chapter Seven summarizes the study. Policy implications and future research needs that could generate additional information to improve the effectiveness of the program are presented. A brief postscript describing some of the implications of this study for Burundi concludes the study.

CHAPTER II. CONCEPTUAL FRAMEWORK

II.1. The Concept of Land

From a legal point of view, land can be defined as the portion of the earth's surface and things which are attached to it by nature, and to objects of values that lie either above or below the surface, over which ownership rights might be exercised (Barlowe, R., 1978). As such, land includes the soil which can be used for crops, pasture, forest, wildlife, and so forth. It also comprises minerals and water. Land can be owned publicly and/or privately. Land therefore involves property rights, which refer to transaction. Transaction embodies the principles of, among others, transferability and enforceability. All property rights should be transferable from one landowner to another in a voluntary exchange. They also should be secure from involuntary seizure or encroachment by others (Tietenberg, T., 1992). Property rights also imply conflict that results from mutual coercion over land use. As defined, property rights raise the issue of the allocation of land among competing uses.

From an economic point of view, land can be identified as a free good or as a scarce resource. The price of land is used as a criterion to differentiate the two attributes

of land. When land is considered abundant, meaning that everybody can get as much land as she/he wants, land could be considered as free. Therefore, no price or a very low price would be attached to it. Land would be taken as an undepletable resource. Its physical supply would be considered as infinite. Historically, land was considered as a free good in the USA. As Tietenberg (1992) puts it, land was too abundant for those who wanted to farm and had to clear it. Was it an illusion to think that land was a free good in the USA?

In the early 1900s, there were 60 people per square mile in the USA (Clawson, M., et al., 1960). At the same time, a relatively high number of people were involved in farming activities. About 35 percent of the population were involved in farming activities in 1910, compared to about two percent of the population today (Ulrich, H., 1989). Therefore, as time went by, farming was not the main activity employing many people. Land is used for other purposes.

Despite the supply of land, the economic supply of land, which is the portion of land useful for agriculture and other uses, is finite. Population increased. Subsequently, the demand for infrastructures increased. Good land was therefore used for agricultural, residential, commercial, industrial and recreational purposes.

Consequently, land can be viewed as space, nature, a factor of production, a consumption good, situation, property, and capital (Barlowe, R., 1978). As space, land provides physical support for all living beings. As such, the supply of land is fixed. It cannot be expanded nor can it be diminished. As nature, land is identified with the natural environment. The biological characteristics of land condition therefore the demand for land. As a factor of production, land, along with labor, capital and management, is a given-nature source of food, energy, and raw materials. As a consumption good, land is coveted by various users because it both adds to people's production and has value as a consumer's good, such as residential property, in its own right. As situation, the location of good land, with respect to markets, its geographic distribution and its accessibility determine the degree to which land will be coveted. As property, land involves real estate and has legal connotations. Land refers to institutional arrangements to regulate land use. As capital, land is something in which people invest.

Land is no longer considered as a commodity, something that can be bought and sold to the highest bidder and which implies a limitless physical supply. Land is viewed as a resource with finite supply which has to be allocated among competing uses (Jackson, R.H., 1981). This allocation of

land has to reflect both the benefits and costs not only to its individual users, but also to the society as a whole because land plays roles other than just providing economic returns. Efforts to regulate land for externalities require therefore the public interest in land use. As such, market mechanisms to allocate land might not be completely effective. Government intervention is thus sometimes necessary for a sustainable land use, which implies that land use in one period should not create land scarcity in subsequent periods.

II.2. Frameworks for Land Use

Three types of frameworks for the analysis of land use are presented. The first framework, the Threefold framework, uses the physical and biological capability of land, its economic and technological feasibility and its institutional acceptability. The second framework, the situation-structure-performance (SSP) paradigm, deals with inherent characteristics of land, the rules of the game, and the performance of policies, given the choice made by decision-makers. The third framework for land use, which guides this study, is a combination of the preceding frameworks. It focuses on both factors affecting land use and the performance of policies.

II.2.1. The Threefold Framework

Land use can be understood as a series of physical, biological, economic and institutional factors that affect, condition, and control the use of land. Thus, the use of land takes place with what Barlowe (1978) calls a threefold framework. This framework involves an approach to understand the impacts various factors have on decisions to use land. The threefold framework can be summarized as follows:

Physical and biological factors are concerned with land capability to generate production (agricultural and non-agricultural). On the one hand, a piece of land may not be suitable for agricultural production because of,say, its composition. On the other hand, land can be good for both types of production because of its physical and biological attributes (landscape, fertility, etc.). Consequently, land use policies are meant to preserve or improve land capability.

Economic factors deal with the availability of land and its allocation between current and potential users. Thus, land use policies must focus on acceptable intertemporal and intergenerational distribution of land. The current level of land use has to secure sufficient land for future generations. From an economic point of view, the efficient

allocation of land ensures sustainability since it maximizes the present value of net benefits from land use to society without reducing the future value of land. Economic factors raise therefore the issues of conservation, or the wise use, and preservation (keep intact) of land as a resource.

Institutional arrangements ensure that land use programs and policies are administratively workable. Some rules are therefore established to influence the behavior of land users. The distribution of land among competing users leads to conflicts over land use. These conflicts result from the scarcer economic supply of land, which, in turn, is due to the increasing demand for good land. These conflicts are interpersonal and intertemporal. They exist between and among private users, among uses, between public and private users, between and among different public users, and between current and future users (Ottoson, H.W., 1963). These conflicts can be resolved by bargaining between individuals as equal or by rationing transaction, which implies power (collective action against an individual). As a result, working rules have to be established and enforced to permanently resolve conflicts. The main question resides in who benefits from the competition in land use.

The distribution of incentives among farmers who enrolled constitute one of the issues brought about by land use. Incentives given to farmers in areas experiencing a

property tax burden, like urban areas, might not be enough to make farming in those areas a profitable activity. As such, the current beneficiaries of a program or a policy may not be the ones who were initially targeted.

The threefold framework indicates factors which affect efficient land use. The framework, however, describes more the situation (inherent characteristics of a good) and the structure (the choice made to deal with the situation) than the performance of an action. The analysis of the performance of any action is necessary in order to suggest changes. Performance is analyzed in the SSP paradigm.

II.2.2. The SSP Paradigm

One approach to measure the performance of a policy, such as farmland protection programs, is to use the Situation-Structure-Performance paradigm, or the SSP Institutional-Impact theory, which focuses on human interdependencies (Schmid, A. A., 1987). This approach describes the situation in which land is being used, indicates the rules of the game (e.g., measures taken to achieve the desired outcomes), and presents the performance of the policies.

The situation involves attributes of individuals, like preferences, values and knowledge of the rules. These

attributes also refer to the community, the number of decision-makers and the degree to which individual characteristics are shared. Finally, attributes include goods. The characteristics of goods determine how one person's action can potentially affect the welfare of another person. As such, there exist incompatible use goods, exclusion cost, economies of scale, joint impact goods, transaction costs, and so forth. These situational features of a good, like land, are a matter of physical and biological factors and are inherent to the good.

The structure is composed of institutional or rights alternatives, which are a matter of human choice. The structure includes, among other things, the boundary (the entry and exit conditions for participation in a program), procedural rules linking decisions together, information rules and sanctions and payoff rules. The structure is therefore chosen. The issue is the adequacy of the choice.

The performance is a function of alternative rights given the situation. It consists for example of the distribution of income, and the number of people participating in a program. Further analysis might inquire whether a given performance will cause a change in the behavior of, say, landowners.

For example, the farmland is an incompatible use good because agricultural activities exclude urban development and vice-versa. Prior to PA 116, legislators in the State of Michigan believed that farmland was disappearing, especially near urban areas, as a result of urban sprawl. The rule of the game consisted of property tax credits, which were established as an incentive to keep land in farming activities. The performance of the policy would therefore be measured in terms of the number of acres enrolled in the program, especially in urban fringe areas.

The paradigm explains the reactions of an individual to an opportunity set, which consists of available lines of action open to individual landowners at any given time. It also helps to identify the beneficiaries and losers of policies.

However, the SSP paradigm does not cover all the aspects of land use. It focuses on intrinsic values of goods, the behavior people exhibit with respect to those goods, and institutional arrangements that establish the rules of the game, which condition the performance of chosen rules. As such, the SSP paradigm is not dynamic enough to show interactions between a linear relationship in land use, made of an inherent situation and a chosen rule, which yield a performance, and factoral effects that guide human interdependencies.

II.2.3. The Framework of this Study

The framework used in this study tries to make the analysis more complete. It takes into account the variables affecting land use contained in the preceding frameworks. It also specifies the context in which the effectiveness of PA 116 is assessed.

This framework combines therefore the threefold framework and the SSP Paradigm. Land is presented as a factor of production which has physical, biological and economic attributes. It is also subject to institutional arrangements, which involve human interdependencies, working in a given situation and under some prescribed rules. These rules may lead to desired results (good performance), which constitute a sustainable land use scheme of keeping enough land for both agricultural and non agricultural activities. They may also result in conflicts in land use, given the physical and biological characteristics of land as well as its location with respect to economic infrastructure.

Land can be used for many purposes. It serves as residential, industrial, commercial, and agricultural production areas. Consequently, each category of land use can be incompatible in use with another category. As a result, the choice of a structure, given a situation and factors affecting land use, leads to a dynamic system that

generates outcomes, which will, in turn, constitute a signal to policy change.

The provisions of PA 116 for example may attract more or fewer participants. The attitude of landowners towards these provisions indicates the effectiveness of the farmland protection program. If more rural counties enroll in the program than urban counties, then PA 116 will not be effective in preventing farmland conversion to non agricultural activities. In other words, if PA 116 is more effective in areas which do not experience urban sprawl than those under rapid economic growth, then the choice of the structure is inappropriate. A change in the policy is needed to reach the target of slowing down farmland conversion in more urban counties.

This study looks into the performance of the existing structure and formulates necessary policy changes to attract more landowners located especially in more urban counties. The study indicates that the Michigan farmland protection program has to sustain farming activities in a context of conflicting land use.

CHAPTER III. LAND USE POLICY AND ISSUES IN THE U.S.

In order to set the context for a more detailed examination of land use policy in Michigan in the following chapters, this chapter overviews the history of land use policy in the U.S. With special attention to farmland protection policies and programs. Some cases of farmland programs across the U.S. are used to illustrate the nature and the effectiveness of those programs. Issues raised by land use policy, and specifically farmland protection programs, such as free market and governmental intervention, are highlighted.

III.1. Overview of Land Use Policy in the U.S.

With about 60 people per square mile, nine times less than population density of some European countries, such as Belgium and Holland, agricultural land was still considered as an inexhaustible resource in the U.S. in early 1900s. (Clawson, M., et al., 1960). During this period, the federal government land use regulations were oriented toward the occupation and appropriate titling of land.

The Settlement Act of 1841 gave preemptive rights to squatters, allowing them to buy up to 160 acres. The Homestead Act of 1862 allowed the government to allocate 160

acres, free of charge, to immigrants in the West who could not afford to buy land (Huemoeller, et al., 1976). Land at this time was not considered as a scarce resource.

Toward the latter part of the nineteenth century, the increased conversion of public domain into private ownership (or family farm ownership) and private management started raising concerns of the depletion of good land (Salter Jr, L.A., 1948). In response, the Revision Act of 1891 was passed in order to counteract the effects of the earlier laissez-faire land use policy promoting free settlement. During this period, foresters, environmentalists and others raised the need for land conservation policy in order to preserve prime land for future generations. Greater government involvement in the sustainable management of land resources was requested (Timmons, J. F., 1978).

The period from the end of the 19th century until the early 1920s, was described by Salter (1948) as the conservation era in U.S. land use policy. Increased immigration, expanded industrialization, and World War I accentuated the fear of land resource disappearance and food scarcity. The practice of wise use of land resources was adopted. The constitution of national forest reserves in 1907 was an example of conservation of land resources.

Following World War I, there was a turning point in land policy in the U.S. The newly created federal Committee

on Land Utilization reported that a shortage of agricultural land was not expected. The Committee then suggested that farmland development programs be slowed down. The only fear expressed by the Committee was a shortage of timber. As a result, the Clarke-McNary Act was enacted in 1924 to allow the federal government to purchase land for forestry purposes. The U.S. Chamber of Commerce suggested a reduction in farmland acreage in order to cut down the price depressing effects of crops in surplus.

Due to the Great Depression of 1929, land investments were considered as a hedge on inflation. Research turned to problems associated with land values and property transfer. During the New Deal era, there was active public intervention in land resource management, such as the creation of commodity programs to influence prices of agricultural products and the purchase of private land to increase national reserves. Governmental intervention was meant to restore the purchasing power that farmers had in the prosperous years prior to Word War I. The intervention was embodied in the Agricultural Adjustment Act of 1933, whose main goal was to control the surplus in food production (Ulrich, H., 1989).

In the post World War II era, land use policy was heavily influenced by several major trends. The demand for agricultural land for non-farm activities increased as

American cities expanded and industries located operations and facilities in rural areas (Woodruff and Frink, 1980; The American Farmland Trust, 1986). The construction of interstate highways encouraged the location of factories in rural areas, causing metropolitan areas to expand, and thereby increasing the conversion of agricultural land to non-agricultural uses (Healy, R.G., 1980).

During the period 1967-1975 it was estimated that three million acres of agricultural land were converted each year nationwide, an average of about 60,000 acres annually per state (Coughlin et al., 1981). In Michigan, this would have meant an annual conversion of almost 0.2 percent of the area, or about 480,000 acres, the equivalent of one county, over the 1967-1975 period. Some estimates indicate that between 1964 and 1969, about 340,000 acres per year were diverted from farmland to other uses (Cochran and Libby, 1977)[6].

At the same time, in the early 1960s, there was a shift toward large farms as the family farm became less competitive in the production of agricultural commodities for export (Ulrich, H., 1989). The farm population, as a percentage of the total U.S. population, decreased by 45 percent during the 1960s.

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[6] Further reduction in available land was anticipated because an estimated 3.9 percent of the total state land was going to be used in the right-of-ways in 1970 (Governor's Special Commission on Land Use Report, 1972).

During the 1970s, suburbs grew as the population moved to smaller cities and towns surrounding major metropolitan areas (Plaut, 1982). This "rurban phenomenon", which took place in the 1970s, increased the demand for land. As a result, farmland values increased, especially in the Midwest[7], because farmland was still considered as a hedge against inflation (Wirth and Penaranda, 1990).

In the 1980s, two schools of thought on land use developed within the Department of Agriculture (Berg and Zitzmann, 1984; Tweeten, L., 1989). The conservative point of view, or the farm fundamentalism school, emphasized that farmland, particularly prime farmland, was a national asset to be protected. Those who held that farming was a way of living in America were concerned about the continued loss of agricultural land. The economic point of view, or the school of democratic capitalism, on the other hand, emphasized the primacy of free market as an efficient way of allocating land. From this perspective, the market should decide on the role of the farm sector in the national economy. Those who held this view point looked at the land as a factor of production, evaluated the productive capability of U.S. agriculture, estimated probable supply of

[7] The percentage change in farmland values per acre was as following: Corn Belt States (289%), Lake States (258%), Northern Plains States (256%), Mountain States (243%), Pacific States (232%), Pacific Northwest States (228%).

and demand for land, and stated that U.S. had an abundance of good land for the long-run (Berg and Zitzmann, 1984).

Although there were changes in land use between years, the overall loss of agricultural land prior to the enactment of farmland protection programs was not very big. During the period 1880-1974[8] (94 years), cropland increased by 104 percent, or about one percent increase per year. Forest land increased by 14 percent during the same period, or an annual 0.2 percent increase. Other uses of land increased by 214 percent, or 2.3 percent annual increase. Other uses of land include land used for service, urban areas, wasteland, transportation, park and recreation. Pasture and grazing land, on the contrary, decreased by 26 percent, or an annual decrease of 0.3 percent. During the period 1950-1959, however, there was a significant increase in land use for other uses of land (141 percent) and forest land (20 percent) (see Table 1 and Figure 1).

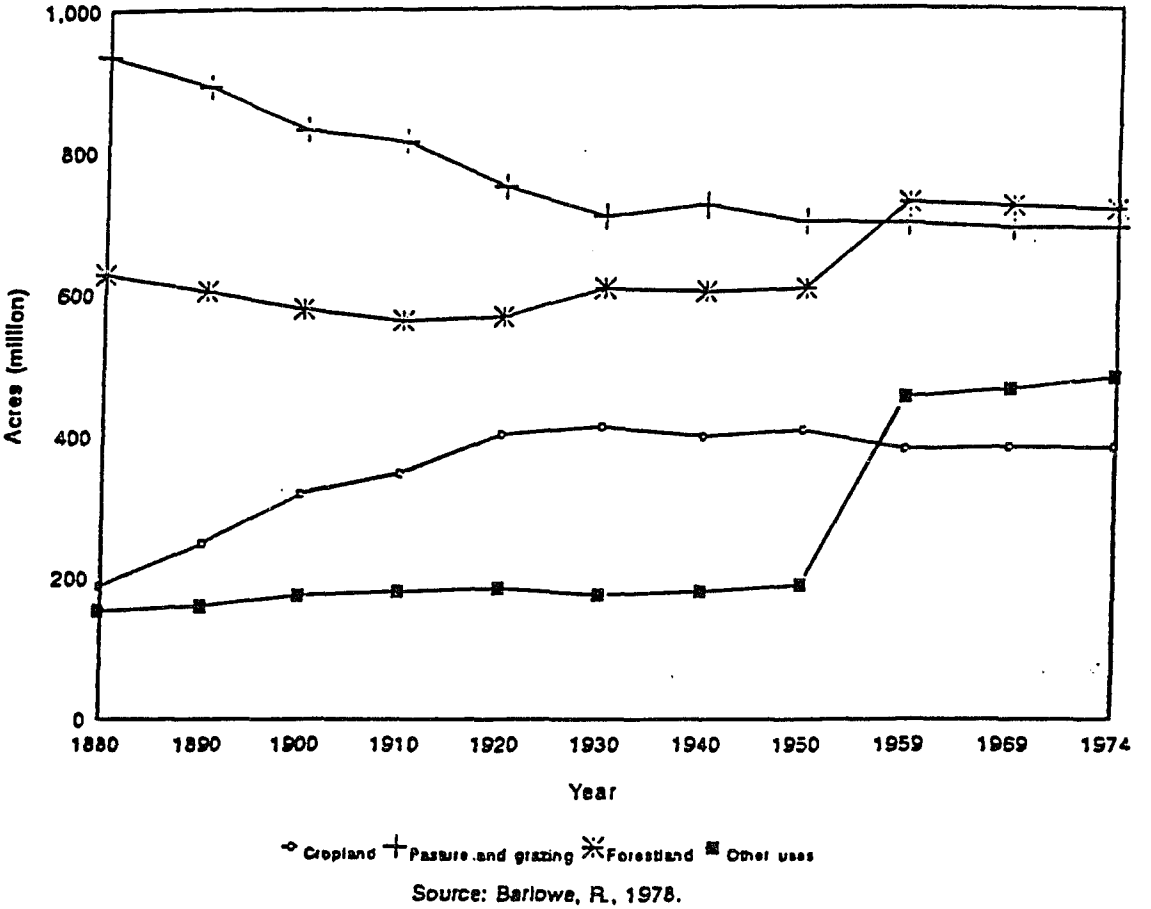
[8] The year 1974 was chosen to illustrate land use in the US prior to the enactment of farmland protection programs.

Table 1 Land Use (million of acres) and Percentage Change in Land Use in the USA, 1880-1974.

Year	Crop	%	Pasture and grazing	%	Forest	%	Other uses	%
1880	188	-	935	-	628	-	153	-
1890	248	32	892	-5	604	-4	160	5
1900	319	27	831	-7	579	-4	175	9
1910	347	9	814	-2	562	-3	181	3
1920	402	16	750	-8	567	1	185	2
1930	413	3	708	-6	607	7	176	-5
1940	399	-3	723	2	602	-1	180	2
1950	408	2	700	-3	606	1	189	5
1959	382	-6	699	-0.1	728	20	455	141
1969	384	0.5	692	-1	723	-1	465	2
1974	383	-0.3	692	0	718	-1	481	3

Source: Barlowe, R., 1978.

Figure 1 Land Use in the USA (million of acres), 1880-1974



Source: Barlowe, R., 1978.

III.2. Policies and Programs to Protect Farmlands

Three groups of farm protection policies can be identified. The first group of policies is based on discouraging non-agricultural uses by levying capital gains taxes which are competitive with land market prices (Coughlin, et al., 1981). Those policies are designed to direct growth out of farming areas. The basis of this policy is comprehensive land use planning, which would exclude extension of facilities in agricultural areas, such as industries. The policies require identification of purely agricultural zones, where agriculture is the major source of the household earnings. Such policies are difficult to administer, however, because they require continual adjustments to changing land market prices. No state has adopted those policies.

The second group of policies is based on regulations, such as right-to-farm and agricultural districts, in order to keep land in farming activities. Special treatments of farmers, consisting of property tax incentive programs, based on preferential assessment, deferred property taxes, and income tax credits are offered to make farming profitable.

Preferential assessment of farmland consists of pure tax relief with no strings. Eligible agricultural land is assessed for its current use value rather than potential

market value. Eligibility conditions consist mainly of the requirement that the agricultural land be under production. In some instances, a minimum number of years that agricultural land has to be under production, and minimum farm income, are required. The program reduces agricultural property taxes by the difference between potential market value and current use value of agricultural land. About 35 percent of the states which have enacted farmland protection programs have adopted a preferential assessment program[9].

Preferential assessment programs are enacted on the assumption that in the absence of reduced taxes, it would be uneconomic for farmers in areas experiencing high property taxes, such as urban fringes, to continue farming. As such, lowering property taxes would be the primary effect of the program. Farmland preservation is a secondary effect.

In addition, the program does not define land under production. Hence, it becomes difficult to administer such a program without a clear understanding of the magnitude of farming operations. Farmland can be purchased by developers to take advantage of reduced property taxes, by putting the land in minimal farming operations. The land will then be converted to non-agricultural uses when the value of the

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[9] The States which adopted the preferential assessment program are, Florida (1959), Indiana (1961), Iowa (1967), Colorado (1967), Arizona (1967), New Mexico (1967), South Dakota (1967), Delaware (1968), Idaho (1971), North Dakota (1973), Wyoming (1973), Oklahoma (1974), Missouri (1975), Louisiana (1976), West Virginia (1977), Arkansas (1980), and Mississippi (1980) (Coughlin, et al., 1981).

land appreciates because there is usually no penalty against withdrawal from the program. As a result, preferential assessment does not insure the long-term preservation of farms (Jackson, 1981; Dunford, 1984).

The program also reduces tax revenues to local governments, which are comprised primarily of property taxes. Hence, a property tax burden is put on other property owners in order for local governments to compensate the loss in revenues. Consequently, preferential assessment program may result in further agricultural land conversion.

Deferred taxation requires that a variable percentage of back taxes are due if farmland is converted to non-farm uses. Eligibility requirements vary from state to state. Some states, such as Texas prohibit corporate enrollment. Other states, like Nebraska, include minimum farm income per acre, and a minimum period of time for land to be under production. Nearly 57 percent of the states which enacted farmland protection programs have adopted this deferred taxation program[10] (Coughlin, et al., 1981).

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[10] These states, in chronological order of adoption, are: Maryland (1956), Hawaii (1961), Connecticut (1963), Oregon (1963), New Jersey (1964), Texas (1966), Pennsylvania (1966), Alaska (1967), Minnesota (1967), Rhodes Island (1968), Utah (1969), Vermont (1969), Illinois (1970), Washington (1970), Maine (1971), New York (1971), Virginia (1971), New Hampshire (1972), Massachusetts (1973), Montana (1973), North Carolina (1973), Nebraska (1974), Ohio (1974), Nevada (1975), South Carolina (1975), Kentucky (1976), Tennessee (1976), and Alabama (1978).

Deferred taxation involves yearly assessment of enrolled farms at their use and market values since the rollback is due when land is converted. The use-value serves as a basis for current taxation. The potential value is used to compute the repayment when land is converted. Determining two values for each qualified farm can create administrative difficulties.

Like the preferential assessment measure, deferred taxation programs lower local government tax revenues. The deferred taxation program was found to have little impact on preventing the conversion of farmland to non-agricultural use in many states. The penalty may have been too little to prevent land conversion. In Montana for example, Jackson (1981) found that a rollback tax of $111 per acre had to be paid, whereas the market value of the land was $2,000 per acre. In Texas, the 1966 program had also little impact on land use patterns in metropolitan and in urban fringe areas (Ozuna and Jones, 1986). In Oregon, with 84 percent of farmland enrolled in the 1963 program, this deferred taxation program was called a success (Brumback, 1989). However, the program did not attract many landowners in urban areas. Only eleven percent of participants were in urban areas. In New Jersey, more weight is being put on the need for housing than for retaining farmland (Brumback, 1989). From 1986 to 1987, about 90,000 acres were converted

to urban uses. Once more, it appears that the property tax relief is used as a means of speculation rather than an incentive to protect farmland.

With the circuit breaker tax credit, landowners receive property tax credit against their State income tax. As a "circuit breaker", the program interrupts agricultural property taxes deemed excessive with respect to farmers' household income. Eligibility requirements include minimum length contracts, farm size, and household income. The circuit breaker tax credit relieves landowners from additional real property taxes once a given percentage of their income is exceeded. Michigan (1974) and Wisconsin (1977) are the only states to have adopted the circuit breaker program.

Agricultural land is assessed for tax purposes at its market value. The land is not exempted from local taxation, and the assessed market value is taxed at the local level. Tax benefits to the landowner are derived through the State and Federal income tax. For example, under the provisions of PA 116, landowners are entitled to claim as a credit on their Michigan Income Tax the amount by which property taxes on the farmland covered by the agreement exceed seven percent of their household income (DNR, 1992). For instance, if the household income of a farmer is $200,000 and the property tax against the farm is $24,000, the credit

will be computed as following: $24,000 - ($200,000*0.07)= $24,000 - $14,000 = $10,000. If the property tax against the farm were, say, $10,000, the farmer would not get any refund. The circuit breaker becomes therefore effective when farm property taxes exceed seven percent of the total household income (Marshall and Kerns, 1982).

Unlike preferential and deferred taxation programs which reduce local government tax revenues, the circuit breaker does not directly affect local governments financially. The circuit breaker also excludes landowners who have large non-farm income. In Wisconsin, on the one hand, findings by Jackson (1981) showed that the program targeted middle and low income farmers. Targeting the low income farm population, however, requires increased costs to the state because property tax credits are the difference between a given percentage of the household income and the amount of property taxes.

On the other hand, the empowerment of local governments was found to be a key factor in the administration of the program in Wisconsin (Emelock, 1989). Local governments were responsible for administering and enforcing the program. During the period of 1977-1987, 70 out of the 72 counties participated in the program. About 65 percent of farmers enrolled. Emelock, however, noticed that conversion of farmland increased because property tax credits were not

competitive with market prices of farmlands. The effectiveness of the program was measured by the landowner and county participation without looking at the geographic distribution of enrollment.

A third group of policies prevents changes in the use of designated parcels of land from agriculture to non-agricultural uses by imposing restrictions on farmers, such as restrictive agreements, agricultural zoning, development permit systems, purchase of development rights, purchase and resale with restrictions and the transfer of development rights. Agricultural land is not easily converted to other uses because of the tight control over it.

Restrictive agreements require that the landowner agrees to certain restrictions in return for tax relief (Relis, P., 1978). Landowners enter into enforceable agreements which permit release only under specified and usually stringent criteria. California adopted the restrictive program in 1965, called the Williamson Act (Coughlin, et al., 1981).

Restrictive agreements as administered in California were found ineffective to keep land in farming. The Williamson Act of 1965 did not attract many landowners. By 1972, only one-tenth of privately owned land had enrolled. Beneficiaries of property tax relief were large farmers located far from urban centers (Relis, 1978; Jackson, 1981).

Moreover, acreage enrolled indicated that urban prime farmland represented only two percent of the total agricultural land, other prime farmland were 14 percent, and non-prime farmland represented 30 percent (Abrams, 1989). Non-prime land was the major component of enrollment. Hence, the program did not attract prime farmland. Abrams concluded that the difficulty in controlling urban sprawl, funding shortages, and the lack of coordination in administering and enforcing the program impeded the program from achieving wider success.

III.3. Issues in Farmland Protection in the U.S.

The conversion of farmland to non-agricultural uses became a nationwide concern in the U.S. in the 1970s (Fletcher, 1984; Zitzmann, 1985; Grossi, 1987) but faded quickly in the 1980s. About 55 percent of the farmland protection programs were developed during the period 1969-1978. Nearly four percent of the states adopted those programs in 1980s (Coughlin, et al., 1981). There are four major issues raised by these programs which are of particular interest for this study.

First, governmental intervention to regulate farmland conversion to non-agricultural uses, as opposed to free market forces in land use, is a key issue in farmland

protection. Market forces are the major influence in determining the use of land (McDonald and Rickson, 1987). In other words, the law of supply and demand, i.e., free land market, regulates land use. Farmland protection programs are not, thereby, one of the solutions to efficient land allocation because tax incentives restrict the supply of agricultural land, while the demand for it keeps increasing. Hence, governmental intervention in farmland protection constitutes a market failure because it allows inefficiencies, such as subsidies to farmers, which are negative tax revenues to the State.

For people who believe in market forces as a regulatory mechanism of agricultural land use, farmland protection programs are unnecessary because the buyer of agricultural land pays what the latter would be worth in its best alternative. Land market would therefore be affected by the location of the agricultural land, the discount rate (interest rates), and, thus, the net present value that individuals put on the land.

Short-run profit oriented farmers do not enroll in farmland protection programs because they expect higher prices per acre of land. With free market land regulation, farmers who would prefer to stay in farming activities, but whose farm income is eroded by increased property taxes, resulting from land value appreciation, would be obliged to

quit farming and sell the land to developers. The financial situation of farms in the Lake States, Corn Belt States, and Northern Plains States for instance indicates that about 70 percent of farmers were in financial stress, a situation where farmers cannot repay loans, and five percent were force to quit farming (Wallace, T. L., 1987). Farmers who face financial hardship might be protected against the burden of property taxes. Agricultural land policy, however, was not catching up with this financial crisis (McKinzie, et al., 1987).

Second, the balance between control over farmland protection programs and incentives offered to landowners is another key issue in farmland protection. If the control is rigid (a lot of penalties to participants who violate any of the rules) and the incentives are too weak, participation is expected to be low. Conversely, if attractive incentives are offered to landowners, coupled with less rigid control, participation is likely to be high (Coughlin, et al., 1981).

In addition to satisfactory monetary incentives, enforceability of programs has to be accompanied by the freedom to exercise property rights on land to increase participation. That is, farmers enrolled in such programs should be allowed to withdraw (exit) if they find that the conditions imposed on them are stricter than they expected.

Third, farmland assessment, which consists of comparing use-value to the fair market value, is also a major issue in deciding on the refunds and/or the repayments. The use-value assessment, or differential assessment, is intended to break what Dunford (1984) calls the urban sprawl cycle by not allowing relatively high market values to increase the assessed value of farmland. The urban sprawl cycle starts with the extension of cities. This extension increases farmland values. Subsequently, farmlands in the areas of extension have high assessed values, and increased property taxes. Farm income declines, resulting in a situation of farm financial stress, which accelerates agricultural land sales and furthers urban sprawl. In case property taxes on agricultural land exceed tax levels consistent with agricultural use of the land, farmers may prematurely sell their land (Gustafson, 1977). As such, use-value assessment may stimulate farmland conversion to non-agricultural uses.

Fourth, comprehensive land planning is an important issue in farmland protection programs. Comprehensive land planning consists of a process leading to adoption of a set of policies regarding land use: crops, transportation, housing, public facilities, and economic and social issues (Coughlin, et al., 1981). That is, concerted action by institutions involved in land use is necessary for the success of the program.

III.4. Summary of the Chapter

This chapter traced the history of land use policy in the U.S. As land use policy passed from a laissez-faire period to increased governmental intervention to regulate land use, several types of farmland protection programs were adopted to reduce the burden of property taxes on farmers, and subsequently, to reduce farmland conversion.

Various policies and programs to protect farmlands were examined. Four main groups of issues related to farmland protection were presented. They were: (1) the intervention of the government in regulating land resources use; (2) the balance between incentives and enforceability of the program; (3) farmland value assessment; and (4) land planning.

CHAPTER IV. FARMLAND PROTECTION IN MICHIGAN

Eighteen years after the first state, Maryland (1956), adopted a farmland protection program, the State of Michigan enacted PA 116. This chapter discusses the legislative history of the Michigan Farmland and Open Space Preservation Act of 1974 and the principal issues in the current debate on PA 116. The discussion provides the basis for identifying the research questions which will guide the assessment of the effectiveness of PA 116 in the following chapters.

IV.1. Legislative History of PA 116

In the State of Michigan, land use policies started to raise significant concerns in 1960s because of increased property taxes on farmers (Smith, R.E., 1992). The State of Michigan took about 18 years after the State of Maryland first adopted the deferred taxation program in 1956 because it was still collecting information on experiences of other states in farmland protection, such as New Jersey (1964), California (1965), Washington (1970), and New York (1971). It also took time to convince State legislators and local governments of the benefits of the program to farmers (Smith, R.E., 1992).

Prior to the enactment of PA 116, the State of Michigan did not have any farmland protection legislation. During the period of 1965-1967, legislation was proposed, but never implemented, to (1) amend the constitution to prevent the use of use-value assessment as a method of preserving farmland; (2) set a specific tax for agriculture, which would apply to agricultural land statewide; and (3) amend the state income tax to allow a special tax credit for agricultural land owners (DNR, 1991). Local governments, fearing revenue losses and land speculation, opposed these proposals.

For about 10 years, preferential tax assessment legislation was widely discussed. Local governmental units also opposed this legislation since it meant reduced property tax revenues (Michigan Department of Transportation, n.d.). In addition, banks opposed the proposed legislation for its restrictions on the sale of land (Smith, R.E., 1992).

Under the proposed Michigan land legislation (PA 116) advocating property tax credits, farmers agreeing to participate in the proposed program would be provided with a tax incentive not to convert their land into non-agricultural use. In addition to agricultural property tax credits, participants in PA 116 are exempt from special assessments for sanitary sewers, water, lights, or non-farm

drainage crossing their property, unless the assessments were made prior to the recording of the agreement or easement (Michigan Farmer, 1975). Farmland would be assessed in terms of both its market and its use values. The difference between the two farmland value assessments would be the basis of the property tax incentive. The proposed legislation did not require a minimum length of contracts. The conversion of farmland to non-agricultural use would result in the repayment of property tax credits received for the last three years (Cochran, 1976).

During several legislative sessions, many amendments were added, such as the inclusion of farmer's income in the criteria of eligibility for incentives, payment of interest on tax credits to repay when land is converted to non-agricultural use, and an increase of the roll-back period from three to five years (Cochran, 1976). The proposed legislation passed the House of Representatives but it did not pass the Senate. The Senate argued that the proposed legislation was not constitutionally acceptable. The Senate (S.B. 130) also suggested that a minimum five year contract be established. The penalty for converting land would be reduced according to the time remaining in the program. A higher interest rate on property tax credits would be charged to farmers who withdrew from the program after one year (12.15 percent), whereas a lower interest rate on

property tax credits would be charged to farmers who remained longer in the program (2.43 percent the fifth year).

Other opponents of the proposed legislation were local government units and assessors and the State Tax Commission. Local governments feared losing tax revenues. Assessors and the State Tax Commission were worried about the cost of handling two assessments for each qualifying farm.

As originally drafted and introduced on February 22, 1973 (House Bill No 4244)[11], the Michigan Farmland and Open Space Preservation Act provided for a specific tax on certain agricultural and horticultural lands; taxation on land improvements; and a rollback of taxes under certain conditions. The proposed legislation was specifically aimed at reducing the property tax burden on farmers located in urban fringe areas.

The proposed bill provided for a specific tax schedule based on land use capability classes defined by the Soil Conservation Service. Several amendments were made to the bill, including (1) assessing land at standard values based on the Soil Conservation Service's capability classes and then applying the local property tax millage rates; (2)

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[11] The Act was introduced by 61 members (Appendix 2). About 60 percent of the sponsors were Republicans, and the remaining 40 percent were Democrats (Smith, R.E., 1992).

changing the penalty for each year the land remained in the agreement from 24.4 percent in the first year to 4.8 percent in the fifth year; and (3) imposing an interest rate on the roll-back taxes of six percent due when conversion of agricultural land occurs (Cochran, 1976).

The bill passed the House of Representatives but it did not pass the Senate because its proposed computation of tax credits was unacceptable. The Senate Tax Committee appointed a Special Committee to review the proposed HB 4244. The major recommendation by the Special Commission was to pay tax credits which were equivalent to the amount of farm property taxes exceeding seven percent of farmers' household income.

Defenders of PA 116, like the Departments of Natural Resources and Agriculture, and the Michigan Farm Bureau[12], argued that since agriculture and tourism were the state's second and the third most important industries, the State of Michigan should keep its agricultural land under production to respond to changing market conditions, despite overproduction (Journal of the House of Representatives of

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[12] Other supporters of PA 116 were: Soil Conservation Society of America, USDA Agricultural Stabilization and Conservation Service, Tri-County Regional Planning Commission, and USDA Soil Conservation Service (Michigan Farmer, 1973). The Michigan Milk Association, Livestock and Fruit Growers also supported the proposed legislation (Smith, R.E., 1992).

the State of Michigan, 1973 and 1974; Legislative Analysis on House Bill 4244, 1974; Public Sector Consultants, 1988).

Various institutions opposed the proposed legislation. Some local government officials, such as Supervisors of the 48th District, argued that the long standing overproduction in Michigan agriculture offset the need to prevent the conversion of agricultural land to other uses. The extent of the loss of farmland was therefore a key issue in protecting agricultural land in Michigan. For example, the loss of prime and good land[13] in southern Michigan, using aerial photography, was estimated at 365,191 acres (about 23,000 acres per year or 561 acres per county per year) between 1962 and 1978, or six percent of the prime and good land in the State of Michigan (Bennett, 1986).

These Supervisors added that any constraining provision would be contradictory to the voluntary nature of the program. The same group also argued that PA 116 would benefit large landowners with holdings away from urban fringe areas (Journal of the Senate of the State of Michigan, 1974; Journal of the House of Representatives of the State of Michigan, 1973 and 1974; Legislative Analysis on House Bill 4244, 1974; Public Sector Consultants, 1988).

School District Unions also opposed the proposed legislation, fearing a reduction in local property tax revenues and support for school district budgets. Likewise,

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[13] The equivalent of class I through class III.

Federal Land Banks were concerned about the repayment of loans by farmers enrolled in the proposed program (Smith, R.E., 1992)[14].

Parallel to the HB 4244 (1973-1974), the Michigan Department of Agriculture proposed another farmland protection program which does not allow any land conversion (Cochran, 1976; Smith, 1992). Under this proposal, the State would purchase development rights of selected farmland Once 80 percent of the rights were purchased in a given local government unit, such as a township, the State could exercise the power of eminent domain to acquire the remaining 20 percent. This proposal was not acted upon since it was considered too costly to implement. There was also a concern about a State agency having the power to condemn and to resell the development rights at any time without the consent of landowners. House Bill 4244, Farmland and Open Space Preservation Act, PA 116, was approved and signed by Governor Milliken on May 3, 1974.

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[14] County level representatives of the Farm Bureau did not support the program when it was enacted because they did not believe it was responding to an urgent problem (Smith, R.E., 1992). The Michigan Farm Bureau operates as a lobby group. In addition to its contribution to the preparation of PA 116 by collecting information on farmland protection programs elsewhere in the U.S. (Smith, R.E., 1992), the Farm Bureau analyses problems of farmers and formulates actions to promote farmers' well-being, through education, and creation of economic and social opportunities (Michigan Farm Bureau, 1992). The Farm Bureau has county level representatives who are in permanent contact with farmers.

IV.2. Eligibility in the Program

The criteria for eligibility are: the size, the gross annual income, the type of farm, and ownership. Three categories of farms are identified according to the size and the income from the farms: 40 acres or more in size, farms of five to 40 acres with a gross annual income of $200 per acre, and specialty farms of at least 15 acres with a gross annual income of at least $2,000 (see Appendix 1). Small farms and income were included in the criteria because vegetable farms for example are generally small, yet they generate income which is comparable, or even more than large farms (Smith, R.E., 1992).

IV.3. Enrollment and Withdrawal

Enrollment and withdrawal from the program follow procedures that involve several institutions (see Chart 1). An enrollment application must be filed with the local governing body, such as village, city, township (if it has adopted its own zoning ordinance), or the county (for counties which have not adopted a zoning ordinance). The local governing body must notify the county (or regional) planning commission and the Soil Conservation District agency. If the land lies within three miles of the boundary

of a city or one mile of a boundary of a town, village, township, or county, the governing body of such town or city must be notified. Thirty days are allowed for review, comments, and recommendations about the eligibility of the applicant. If the application is approved by local governing bodies (which do not have the final decision to approve or reject an application), it is forwarded to the Department of Natural Resources, where the administration of PA 116 is centralized. Afterward, the DNR forwards it to the State Tax Commission for its review, including a property description and value verification. The State Tax Commission submits its comments to the DNR, which has to give its final approval. If approved, the DNR prepares a farmland development rights agreement of at least 10 years. DNR indicates rules pertinent to administration of PA 116. It also reports and makes recommendations to the legislature.

If the application is rejected by the local government bodies, the applicant may appeal the rejection to DNR, which can reject or approve the application (see Appendix 1)[15]. Two applications out of 400 were rejected in 1992. Almost half of applications are returned to applicants because they are incomplete (DNR, 1992).

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[15] Other institutions involved directly or indirectly in PA 116 are the Michigan Farm Bureau, lending agencies, the Michigan State University Extension Service and the Court (see chart 1).

Any early withdrawal from the program is subject to penalty. If a landowner decides to terminate the contract prior to the agreed date, the total amount of all tax benefits granted by the program must be repaid at a compounded interest rate of six percent per annum. If the agreement runs its full period and the landowner decides not to re-enroll, the last seven years of tax benefits have to be repaid without interest (DNR, 1974). The lien applies therefore to both natural and early termination of agreements. Although the lien is imposed, 80 percent of landowners enrolled have stayed in the program less than 10 years (DNR, 1991).

The remaining PA 116 provisions are (see Appendix 1):

- non farm structures cannot be built on enrolled land;
- improvements cannot be made or any interest in the land sold except for a scenic access or utility easements which would not change the character of the land without prior state approval;
- tax benefits do not need to be repaid if the land is withdrawn from the agreement based upon a determination of public interest;
- the lien is discharged if the landowner reenters the program or renews the agreement/easement.

IV.4. Current Debate on PA 116

Currently, the Michigan Farm Bureau, a working group led by Senator Nick Smith (Senate Bill 174), another led by Representative Thomas Hickner (House Bill 0000), and another by Representative Margaret O'Connor (House Bill 5314) are trying to propose changes to P.A. 116. These changes include the reduction of the length of contracts, the reduction of the lien, and the addition of conservation measures to PA 116 provisions. PA 116 is being revamped in order to respond to the prevailing socio-economic conditions of the State.

During the 1970-1990 period, population migration increased in the agricultural areas in southern Michigan. Urban and other developed land grew from 4.2 percent of the statewide land in 1968 (Kimball and Bachman, 1969) to 6.3 percent in 1990 (DNR, 1990). The population outside the standard metropolitan statistical areas in Michigan increased from 15.4 percent of the total population in Michigan to 17.2.percent during the period 1970-1980 (U.S. Department of Commerce, 1982). The demand for farmland increased, causing farmland values to appreciate. As a result, property taxes increased. Farm income eroded in about 70 percent of counties in southern Michigan (C.R.I.S., 1991), accelerating farmland conversion to non-agricultural

uses.

The Senate Bill 174 suggests changes in the length of contracts, termination and repayment of lien. The House Bill 5314 proposes an amendment to the General Property Tax Act that requires local assessors to determine true cash value of all property enrolled in PA 116 as agricultural, regardless of its classification. The House Bill 0000 requires all new contract holders to develop and implement conservation plans (PA 116 Working Group, 1992).

There is no consensus yet on the length of contracts. Some members of the group propose a minimum length of a contract of two years (Senate Bill 174) and five years (Michigan Farm Bureau). The Working Group also disagrees on the lien reduction. HB 0000 suggests that contract holders who implement a conservation plan have a reduction of 25 percent of lien on property. The Michigan Farm Bureau recommends a reduction of one-seventh of lien on property.

The proposition by the House Bill 5314 may increase farmer participation in the program, but it raises the cost to State government. Landowners who wish to enroll in PA 116 would tend to overassess their land to get higher property tax credits. However, they would have to pay back a large amount of the lien when they terminate the contract. The Tax Commission, on the other hand, would lower farmland values of enrolled farmers because the refunds by the State

government are claims to the income revenue.

Under this alternative assessment suggested by House Bill 5314, farm property taxes would increase if land appreciates, due to economic growth in the area. Consequently, farmers who are not enrolled in PA 116 may go bankrupt if the household income does not increase at least at the rate of property taxes. For example, farmland is lost to lenders in Michigan because some farmers cannot repay loans. About four percent of farmers quit farming activities in Michigan in 1987; five percent were in extreme financial stress, a situation where a farmer is unable to repay debts, and 18 percent were in serious financial stress (National Public Policy Education Committee, 1987; DeLind, 1989 and 1990). Enrollment in PA 116 would therefore be one way to avoid bankruptcy since the state would refund farmers the amount by which the property taxes on the farmland enrolled exceed seven percent of the household income. Farmers who are enrolled in PA 116, would therefore enjoy higher refunds if property taxes increase faster than their household income. The State government, on the other hand, would bear an increased cost if land values continue to appreciate.

House Bill 0000 provisions for conservation measures, on the contrary, might decrease farmer participation in the program. This proposed measure adds to the already

constraining provisions that farmers would like to see loosened. Moreover, stricter enforcement of PA 116, with a small discount on the lien, may also limit enrollment.

Unlike the proposed House Bill 0000, the suggestion by Farm Bureau and the proposed provisions of Senate Bill 174 to relax several provisions of PA 116 may increase farmer's enrollment. Cutting the length of contracts along with the reduction of the lien could be seen by farmers as a way of keeping their property rights, which constitute an incentive to enroll. The proposed reduction of the lien, however, is still small, and may constitute a limiting factor in enrollment.

IV.5. Issues in Farmland Protection in Michigan

The main issues raised by farmland protection in the State of Michigan are similar to those of the US. They deal with land regulation, incentives, penalties and land assessment. These issues consist of: (1) farmland value assessment, (2) equity in the distribution of incentives, (3) the competitiveness of the program, and (4) its enforceability.

Farmland value assessment (use and potential) to the State government worried government officials. Over and/or underassessment of agricultural land complicates taxation of

agricultural property because use-value of farmland is considered rather than potential values. For example, there was a 77.1 percent overassessment in Gratiot county and a 21.1 percent underassessment in Kent county in mid 1980 in Michigan (Harvey, et al., 1987). Use-value assessment was proposed as a planning tool in Michigan (Proceedings of the Seminar on Taxation of Agricultural and other Open Land, 1971). Prior to PA 116, one of the goals of the State of Michigan was to modify property tax law to reflect use-value rather than potential value assessment to encourage the retention of agricultural and open space land (Governor's Special Commission on Land Use Report, 1972).

The equity of incentives among participants (rural versus urban) and between participants and non-participants was one of the reasons for opposing the program. Farmers located in rural areas may benefit more than those near urban areas because of the inadequate property tax credits with respect to market prices of land in urban areas. In addition, property tax credits are negative tax revenues to the State of Michigan. The State government has to compensate the loss in tax revenues by increasing taxes to other categories of the population.

The competitiveness of PA 116 credits in urban fringe areas, with respect to market prices of land, is another issue. PA 116 credits may not rise as quickly as market

prices of land located in areas experiencing rapid economic growth. The amount of incentives to offer to farmers who participate in the program is therefore a major concern in farmland protection in Michigan.

Enforceability of the program, consists of the type and the magnitude of the penalty to use against landowners who terminate their contracts early. As economic development takes place in southern Michigan, landowners may sell their land (or part of it) to take advantage of the resulting increased market price of land. That is, the lien imposed on contract termination might be too small to retain landowners in the program.

IV.6. Research Questions

An assessment of the effectiveness of farmland protection programs, such as the Michigan Farmland and Open Space Preservation Act of 1974, raises two main questions. First, do the property tax incentives offered to farmers, especially those in urban fringe areas, influence enrollment in the program? The assumption behind PA 116 is that farmers located in urban fringe areas, would respond to property tax relief as enough of an incentive. Second, does the enforceability of PA 116 lead to more retention of farmlands especially in areas of rapid economic development?

A lien is imposed on farms whose contract is terminated early.

IV.6.1. Incentives

Gardner and Barlowe (1978) tried to have a complete picture of the impact of tax policy by comparing land values and property taxes. They noticed that if taxes increased at the same or slower rate than land values, landowners would not quit farming. If taxes were increasing at rate of, say five percent and agricultural land values at a rate of 10 percent, farmers would be able to keep their farms in farming activities because the expected market price of their real estate would be higher than the cost of running farming activities.

There have been debates over the effectiveness of agricultural property tax relief as a means to protect farmlands. Levin, Rose and Slavet (1974) stated that tax policies are often in direct conflict with land use objectives, which may create a desincentive to preserve farmlands. They suggested the adoption of corrective mechanisms, i.e., integration of taxation with planning to make tax policy an incentive. While Levin, Rose and Slavet looked at the effectiveness of property tax incentives on land use, the National Task Force on Research

Related to Land Use Planning and Policy (n.d.) focused on the consequences of the incentives on local government revenue, and, implicitly, on land use. The National Task Force on Research Related to Land Use Planning and Policy stated that reliance on property taxation created an incentive for local governments to compete for (rather than control) commercial development and expensive residential development because of their favorable fiscal impact.

Property taxes constitute a major source of revenue to local governments and organizations, such as townships, cities, villages and schools[16]. In case the State refunds farmers, while local governments continue to collect property taxes, those institutions will not be directly affected by property tax credits to farmers, at least in the short-run.

Property tax credits vary according to financial conditions that farmers experience. If farmers'household income is not high relative to the amount of agricultural property taxes, PA 116 refunds to farmers will be relatively high. Property tax credits were about $615,000 in 1975. They were nearly $78,000,000 in 1984, corresponding with the first phase of minimum time period of a contract. Property tax credits were about $54,000,000 in 1990 (Michigan

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[16] Property taxes remained the single largest source of revenue at the local level in the U.S., amounting to $45.3 billion in 1973 (Gustafson, 1977).

Department of Treasury, 1990). That is, although PA 116 refunds are claims on income taxes, the administration of the program may oblige the State to cut some of the programs, therefore affecting indirectly local governments. As a result, local governments may encourage any development that can increase their revenues. Under these conditions, PA 116 credits might, in fact, increase, rather than discourage, agricultural land conversion.

The high speculative land values compared to low-use value of farms near urban centers offer farmers incentives to sell their land (Angevin, 1986). Urbanization brings about the opportunity to reap a capital gain by selling off the farmland located mainly near urban centers where there is a competition between farming and urban-related services (residential, industrial and commercial sites). Small plots are expected to be a target. That is, the geographic distribution of enrollment becomes an important measure of the effectiveness of PA 116 in preserving agricultural land located near urban areas. Areas where property tax credits are higher than others would indicate a lower level of household income relative to property taxes. They may also be a sign of higher enrollment rate. Less property tax credits, on the other hand could result from higher household income of participants, or from a lower rate of enrollment.

IV.6.2. Enforceability

Farmers think that they can terminate early the contract by repaying tax credits. To them, PA 116 is a voluntary program. Therefore, they think they can get out of the program whenever they want. Are farmers willing to preserve farmland under the conditions of economic development, especially near urban areas? Blocking exit from a voluntary program by imposing a lien may therefore result in more speculation on agricultural land, especially in urban fringe areas. The lien may not be a major constraint on contract termination as long as the market price for agricultural land can allow farmers to pay back the lien and still have net income. Consequently, as economic development continues to take place in southern Michigan, there might be an increased number of withdrawals from the program.

Enforceability of PA 116 may be difficult as economic development takes place in southern Michigan, as a result of the increased access to rural areas via improved transportation systems. Subsequently, agricultural land values are expected to increase. According to Hanson and Kelsey (1991), some farms in southern Michigan were sold at about five times the State's average purchase price for prime farmland. Agricultural land market prices are

obviously higher than PA 116 credits, especially in more urban counties. Tight control over PA 116 in a context of increasing economic growth may thus limit participation in the program. Hence, assessing the effectiveness of PA 116 through its enforcement can help to understand future enrollment.

IV.7. Summary of the Chapter

This chapter reviewed farmland protection in the State of Michigan. The legislative history of PA 116 indicated that prior to the Act, no land use legislation was implemented. The burden of property taxes on farmers, which then forced farmers to sell their land, was the main motive to propose PA 116. Defenders of the program advocated the importance of Michigan agriculture in the statewide economy. There were opponents to the proposed legislation because of the fear of losing tax revenues to local governments and organizations. The bill underwent several amendments before its approval and enactment in May 1974. Enrollment and withdrawal from the program follow some procedures that involve several institutions.

The current debate on PA 116 is directed toward adjusting the program to the prevailing economic conditions of the State of Michigan. There is still disagreement on

ways to go about the adjustment. The main issues raised by farmland protection in the State of Michigan were: (1) farmland value assessment, (2) the beneficiaries of the program, (3) the attractiveness of the program, and (4) the enforceability of the program. Two research questions of this study were: (1) Do property tax incentives influence enrollment? (2) Does enforceability of the program lead to sustained enrollment?

CHAPTER V. METHODS FOR ANALYZING PA 116

Several studies have examined the effectiveness of PA 116 by looking at the number of acres enrolled and the number of contracts signed. This chapter reviews the methods used by previous studies to analyze the effectiveness of PA 116. Based on the findings of this review, the methods used in this study are presented. This chapter finally presents the data sources used and the research design.

V.1. Review of Previous Methods

V.1.1. Surveys

In the State of Michigan, research has described the magnitude of enrollment in PA 116, property tax refunds, number of recipients of property tax credits, land values, and the characteristics of farms. An evaluation of PA 116 was done by Cochran (1976), two years after the Act was enacted, to identify farmers enrolled in the program. This study used a mail survey. The rate of response was 60 percent. The main variables included in the study were age, size of farm own, operated, and enrolled, types of ownership, and distance of farm from a city.

The mail survey used by Cochran had an advantage of reaching many farmers at the same time at a low cost. The study was, however, only farmer-focused. The interaction between participants and the administration of the program was not analyzed to examine the behavior of participants.

A study by Frankel and Connor (1988) used a survey of farmers who enrolled and those who did not enroll in PA 116 to test a series of hypotheses related to the perception of PA 116. This comparative analysis of enrollment and non-enrollment indicates farmers' point of view on the program. However, the study does not address future enrollment.

V.1.2. Interviews

A study by the DNR (1978) consisted of interviews with selected farmers. The results were compared and contrasted to Cochran's findings. The objective of the survey was to evaluate the program in terms of geographic and socio-economic characteristics of farmers who enrolled. The topics covered were the following: size of farms operated, owned, and entered in the program; distance of the farm from urban areas; types of land ownership; age and education level of operators; household income; property taxes; and income tax credits.

The interview method used by the DNR, which consisted of selected farmers, was helpful to get the opinions of participants about the program. However, it was not specified if the selection was random or purposive. Moreover, the study did not concentrate on the central issue of patterns of enrollment near urban areas and elsewhere in the state, which are necessary to improve the administration and the enforcement of the program.

V.1.3. Secondary Data and Interviews

Hoffman (1986) used the township level comparison of enrollment with development pressure index values, as well as informal interviews with county officials to assess the effectiveness of PA 116. Effectiveness was defined in terms of enrollment in areas under development pressure.

The development pressure index values used by Hoffman could be a possible explanation of the lower enrollment near urban areas. However, development pressure index requires comprehensive planning, which is a result of collaborative effort of institutions involved in economic growth of a given area. Hence, effectiveness as defined limits understanding of the impact of incentives and enforceability of the program on enrollment.

Harvey, Norgaard, and Walker (1991); Harvey and Trachtenberg (1990); and Harvey, et al, (1987) used property tax variation to explain enrollment in PA 116. The major tool to analyze the effectiveness of PA 116 was the magnitude of incentives to induce enrollment.

This way of analyzing effectiveness shows the importance of property tax credits in the decision to enroll in PA 116. These property tax credits indicate a geographic distribution of enrollment. However, they do not inform on the magnitude of enrollment, given the total acreage in farm in different counties. A county which is predominantly urban may get relatively lower property tax credits than a rural county because there are not many farmers with large farms. In such a case, the program would be considered as effective because many farmers in urban counties would have slowed down farmland conversion by enrolling their small farms.

V.1.4. Strength and Weaknesses of Previous Methods

The survey and the interview techniques to assess the effectiveness of PA 116 identified landowners who enrolled in the program. They constituted a data bank for further research. The other techniques developed some indicators, like development pressure index values and property tax

variation, which led to an initial evaluation of the program in terms of absolute acreage enrollment.

The previous methods, however, did not define effectiveness in terms of relative enrollment. They did not also focus on the patterns of enrollment to explain the expected enrollment rate, given the magnitude of farming activities in different counties. The previous studies do not also suggest policy measures to increase enrollment near urban areas.

V.1.5. The Methods Used in this Study

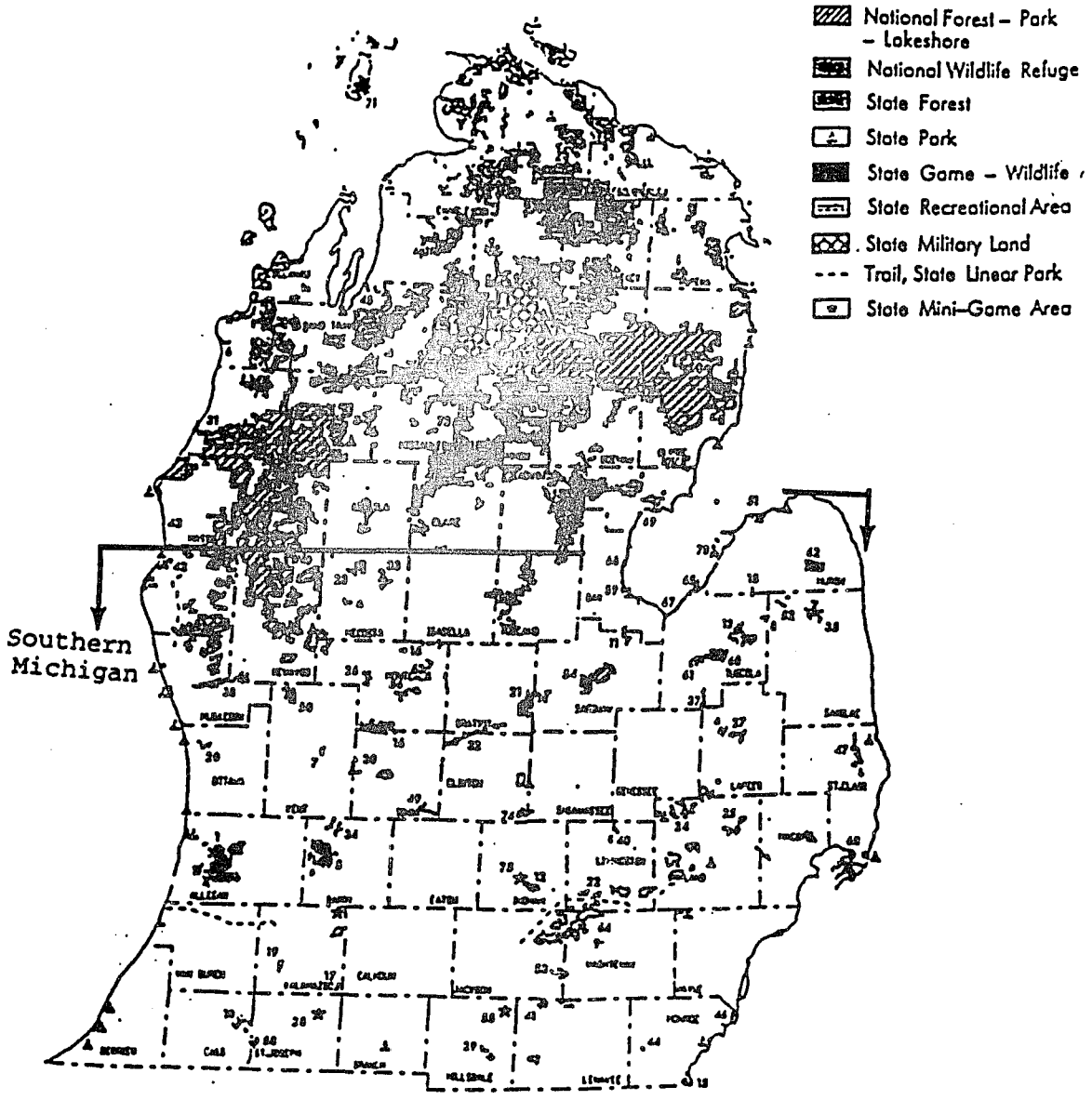
This study uses secondary data from various sources, as well as informal interviews with people who participated in the preparation of the program, current administrators of the program, and institutions affected by or influencing the program. The study also includes an analysis of the current debate on the program. Unlike other studies, this study expands the definition of effectiveness. Effectiveness includes not only the number of acres and contracts signed or early terminated statewide or per county, but it also consists of the relative rate of enrollment per county. This rate takes into account the variability in acreage in farm, farm size, and acreage enrolled across the counties in southern Michigan.

V.2. Data Sources

The area covered by the study is southern Michigan. It encompasses 41 counties from the southern border to the State of Ohio to Oceana county (see Map 2). These counties include most of the state's farmland and are the most populated areas. They account for 81 percent of the state's farmland and 92 percent of its population (Gardner and Frazier, 1981). In addition, about 97 percent of the farmland enrolled in PA 116 and 72 percent of the agreements that have been terminated early are in these counties (DNR, 1991).

The study does not include data from northern Michigan. The latter is comprised largely of public land, especially forests (see Map 2). Moreover, the study does not discuss other types of tax benefits that affect land use, such as the homestead tax credit, nor does it discuss open spaces due to the lack of data on the latter and the complexity of analyzing the impact of several types of taxes on protecting farmland in the same study.

Map 2 Area Covered and Types of Public Land in Michigan



Source: DNR

Aggregate data on enrollment, property tax credits, and contract termination at the State level were collected and are used to document the general implementation of the program. To analyze variability in participation in enrollment and termination of contracts, this study uses county-level secondary data obtained from various State Departments involved directly or indirectly in PA 116, such as the Department of Natural Resources, Transportation, Treasury and Agriculture.

Aggregate data present an advantage of time saving in collecting data from individual participants. They also indicate an overall picture of enrollment and withdrawal from the program. The use of aggregate data also present some disadvantages. Errors embedded in secondary data constitute a limitation to this study. Measurement errors among counties were assumed independent in this study.

Unavailability of data on some relevant variables, such as property tax credits constituted another constraint. For example, data on PA 116 were not complete for the period beginning with 1975, when the first tax refunds started. The distribution of property tax recipients (percentage of recipients per range of credit amount) were not computed each year (Treasury Department, 1992). Property tax assessment and the average household income of participants in PA 116 over time per county were not available in order

to examine the patterns of enrollment or termination of contracts.

The data, at the county level especially, are available for selected years, corresponding to the Census of Agriculture in the State of Michigan. These years do not include 1974 data because the first enrollment started in 1975. The years concerned are 1978, 1982, and 1987. Data from the Census of Agriculture for 1992 were not available when this study was done.

V.3. Research Design

A descriptive analysis is used to assess the effectiveness of PA 116. The descriptive analysis consists of frequencies, graphs, and maps to illustrate enrollment, incentives, farmland values, and termination of contracts. Data used include: accumulated number of acres and contracts enrolled statewide during the period 1975-1990; agreements issued statewide and per county from 1975 to 1991; PA 116 refunds and number of recipients statewide for the period 1977-1989; real farmland values statewide during the period 1977-1990, and per county for the period prior to the enactment of PA 116 (1964-1974) and after the enactment of PA 116 (1974-1987); PA 116 credits as a percentage of total farm property taxes per county for the period 1983-1987; the

total acreage in farms per county in 1978, 1982 and 1987; and accumulated cases of early termination of contracts per county in 1991.

The correlation of different pairs of these variables serves as a technique for the descriptive analysis. Two major aspects of the program, consisting of enrollment and early termination of contracts, are correlated with other variables to assess the effectiveness of the program.

A cumulative adoption model is another technique used to analyze farmland protection programs. This technique looks at the rate of adoption of policies related to those programs. The speed at which an innovation is adopted involves many factors, such as access and quality of information (Feder, G., et al., 1985) and adequate incentives. Adoption is defined as a process an individual farmer or a group of farmers go through from first hearing about an innovation to the final adoption. The actual rate of adoption reflects therefore the attractiveness of the innovation, which involves incentives, like PA 116 credits, as compared to the opportunity cost of the farmland. For instance, selling the farmland at the market price constitutes an alternative to land use.

Feder G. et al. (1985) seem to suggest that measures of the extent of adoption of innovations can be dichotomous or continuous, depending on the level of land use. At the

individual farm level, the extent of adoption of an innovation is a dichotomous measure. This measure consists of farmers who adopt the innovation or those who do not adopt it. At the aggregate level, such as a county, the measure becomes continuous. It consists of the percentage of farmers who adopt the innovation.

Aggregate diffusion behavior over time is a function of cumulative aggregate adoption prior to each point in time. As such, the adoption process of the program is not stationary. It changes with time, given incentives offered to farmers. Subsequently, the rate of adoption helps to measure farmers' awareness of the program. One approach to measure aggregate diffusion is a logistic curve, an S-shaped diffusion path, or a sigmoid diffusion path (Feder, G. et al., 1985), which stresses the importance of information and the magnitude of incentives in adopting the innovation. The higher the rate of adoption[17], the more effective an innovation is. The past pattern in adopting the innovation might constitute an indicator of further rate of adoption. The saturation rate, or the maximum rate of enrollment in a program, is reached when the logistic curve starts to

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[17] $$\text{Adoption rate} = \frac{\text{current enrollment (cumulated acres)}}{\text{potential enrollment (acreage in farm)}} * 100$$

decrease. A program is less effective in a given area, if the saturation rate is lower than certain levels.

Considering the S-shaped curve, three stages can be identified. The first stage corresponds to the period of slow increase in adopting the program. It consists of the portion before the turning point. The second stage of the curve corresponds to the portion from the turning point to the saturation point, where enrollment is stagnant. This stage represents the period of extensive adoption of the program. The third stage of the curve corresponds to the portion where the curve starts to decline. After the saturation point, enrollment in the program decreases.

The S-shaped diffusion path indicates the level at which a program, like PA 116, is adopted in a given area. It can therefore be used to assess the effectiveness of PA 116. However, the S-shaped curve does not give the reasons of such an adoption. For instance, rural counties, where urban sprawl is expected the least, would not enroll extensively more acreage than urban counties, where the property tax is a burden to farmers. Moreover, the unavailability of data on land in farms each year[18] in the State of Michigan leads to an incomplete view of the

[18] The Census of Agriculture is done after five years. Data used cover the following years: 1978, 1982 and 1987. The next Census of Agriculture was not yet published when this study was done.

behavior of landowners in adopting PA 116. Annual agreements in selected counties serve as a broader illustration of the adoption behavior of farmers.

The rate of enrollment per county for selected years is computed. It is the percentage of the current accumulated acreage enrolled with respect to the total acreage in farm per county in selected years. The level at which a county adopted the program indicates the effectiveness of the program. The program will be considered as ineffective in a given county, if its rate of enrollment is less than 50 percent. That is, if less than half of the total acreage in farm is enrolled after more than a decade, especially in urban fringe areas, where the property taxes are a burden, PA 116 would be less attractive to farmers.

The rate of enrollment is used to select counties to include in the sample. It is also used as an estimate of the adoption behavior of farmers in a given period of time. Graphing of the rate of enrollment and annual agreements yield the adoption curves, which serve to illustrate the path followed by a given county in adopting the program.

Two clusters, representing low and high enrollment counties, are formed according to the rate of enrollment in 1987. Low enrollment counties are those where enrollment is less than 50 percent of their total land in farm. High enrollment counties are those where enrollment is at least

50 percent of their total land in farm.

Four counties are selected in each cluster. Eight counties in total, or about 20 percent of the counties in southern Michigan, constitute a sample. They consist of the lowest and the highest rate of enrollment in each cluster.

V.4. Summary of the Chapter

This chapter presented the methodology of the study. It also presented previous methods used to analyze the effectiveness PA 116. The contribution of this study to the understanding of the impact of the program on farmland protection in urban fringe areas was presented as well. Data sources were presented. Advantages and disadvantages of aggregate data were discussed. The research design consisted of descriptive analysis. Correlations were considered as a technique for the descriptive analysis. A cumulative adoption model served also as a technique for the analysis of PA 116.

CHAPTER VI. PA 116: PATTERNS OF ENROLLMENT AND EARLY TERMINATION OF CONTRACTS

Enrollment and termination of contracts are a result of many factors. Monetary incentives, farmland values, potential economic development, the quality of information about the program and the commitment of local governments to implement the program are some of the factors affecting enrollment or termination. This chapter examines the patterns of enrollment and termination of contracts at both the state and the county levels. Property tax credits, real farmland values, the acreage in farms, and the acreage enrolled are the major variables used to analyze the patterns. The chapter is organized in two parts. The first part examines enrollment. The second part examines early termination of contracts.

VI.1. Enrollment

VI.1.1. At the State Level

For about 16 years (1975-1990), accumulated statewide contracts and acres enrolled have increased. The number of contracts went from 335 in 1975 to 49,094 in 1990. The total enrollment increased from 44,938 acres in 1975 to

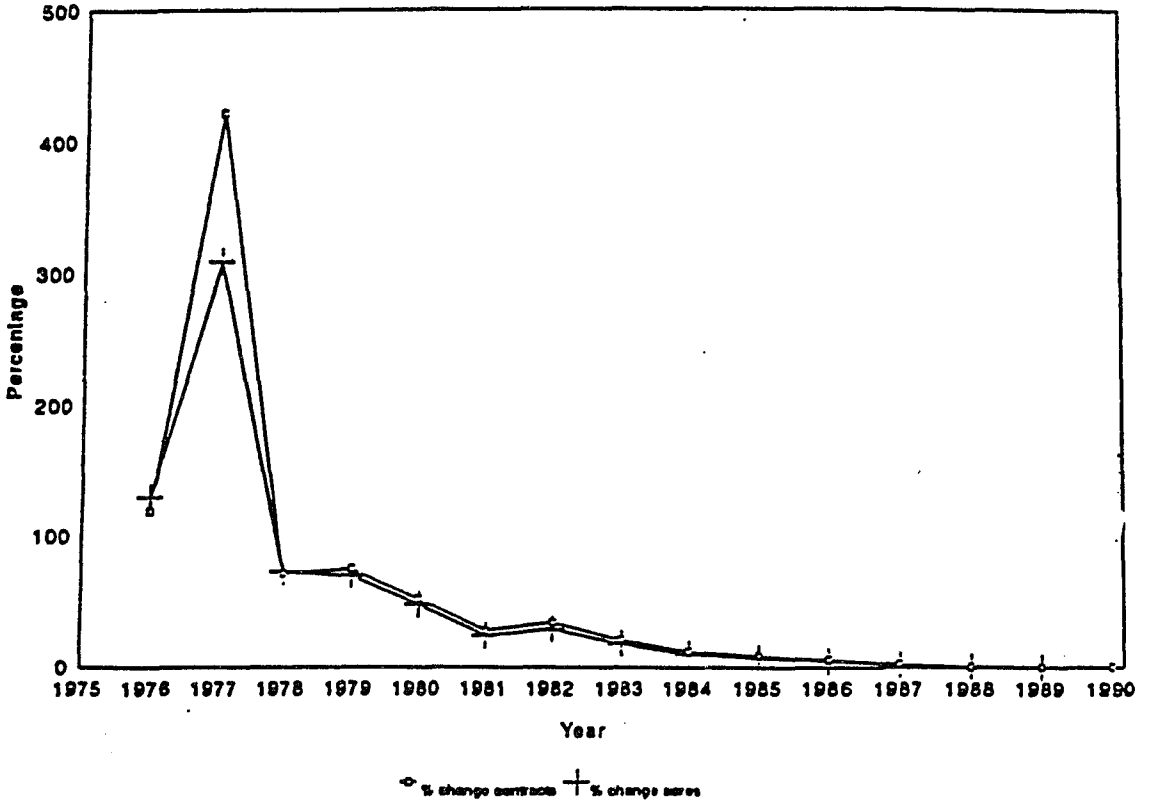
about 4.5 million acres in 1990, or about 44 percent of the total land in farms and 37 percent of farmers in Michigan (DNR, 1991, see Table 2). Following an initial increase in enrollment, enthusiasm tended to fade. As seen in Figure 2, the percentage change of contracts and acres indicate that enrollment declined significantly after 1977. The percentage change shows also that acreage enrolled declined quicker than accumulated contracts after 1978. Farmers continued to enroll in the program but did not bring in as many acres as before. This may mean that farms were divided into small plots, which were gradually enrolled.

Table 2 PA 116: Number of Contracts and Acres Enrolled and Percentage Change per Year, Michigan, 1975-1990.

Year	Accum. contracts	% change	Accum. acres	% change
1975	335	___	44,938	___
1976	733	119	103,341	130
1977	3,826	422	422,415	309
1978	6,562	72	729,399	73
1979	11,456	75	1,239,791	70
1980	17,429	52	1,835,851	48
1981	22,261	28	2,281,863	24
1982	29,847	34	2,939,606	29
1983	36,027	21	3,484,673	18
1984	40,414	12	3,838,977	10
1985	44,116	9	4,130,435	7
1986	46,545	6	4,326,958	5
1987	47,874	3	4,433,940	2
1988	48,275	0.8	4,471,718	0.9
1989	48,597	0.7	4,494,768	0.5
1990*	49,094	1	4,521,546	0.6

Source: Harvey & Trachtenberg, 1990;
(*): Harvey et al., 1991.

Figure 2 PA 116: Percentage Change of Contracts and Acres Enrolled per Year, Michigan, 1975-1990



Source: Harvey and Trachtenberg, 1990; Harvey et al., 1991.

Second, the average acreage per contract has decreased. The average number of acres per contract declined from 134 acres in 1975 to 111, 98 and 92 acres, respectively, in 1978, 1982 and 1990 (Harvey and Trachtenberg, 1990; Harvey, et al., 1991). Hence, although the total number of acres of agricultural land enrolled has increased, many counties in Michigan still did not commit a relatively high percentage of their land to the program in 1990. For instance, 87 percent of all counties in the entire state of Michigan enrolled less than 50 percent of their total farmland in 1990 (Harvey et al., 1991).

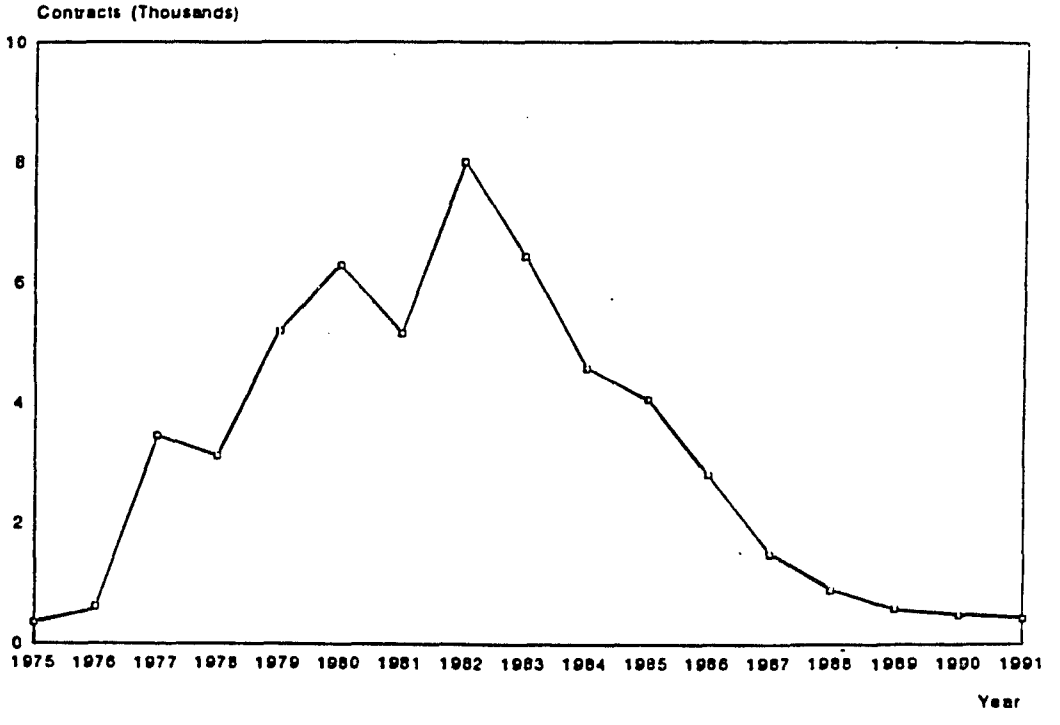
Third, the number of contracts signed annually reached a peak in 1982 and dropped significantly by the mid 1980s. Up to 1977, these contracts increased at an increasing rate. There were variations in contracts signed between 1978 and 1984. Beginning 1985, the number of annual contracts decreased continuously (see Table 3 and Figure 3).

Table 3 Number of Contracts Signed per Year and Percentage Change, Michigan, 1975-1991

Year	Contracts	% Change
1975	362	___
1976	617	70
1977	3,467	462
1978	3,124	- 10
1979	5,210	67
1980	6,304	21
1981	5,174	- 18
1982	8,018	55
1983	6,456	- 19
1984	4,595	- 29
1985	4,076	- 11
1986	2,816	- 31
1987	1,496	- 47
1988	908	- 39
1989	597	- 34
1990	491	- 18
1991	442	- 10

Source: DNR, 1992.

Figure 3 Number of Contracts Signed per Year, Michigan, 1975-1991



Source: DNR, 1992

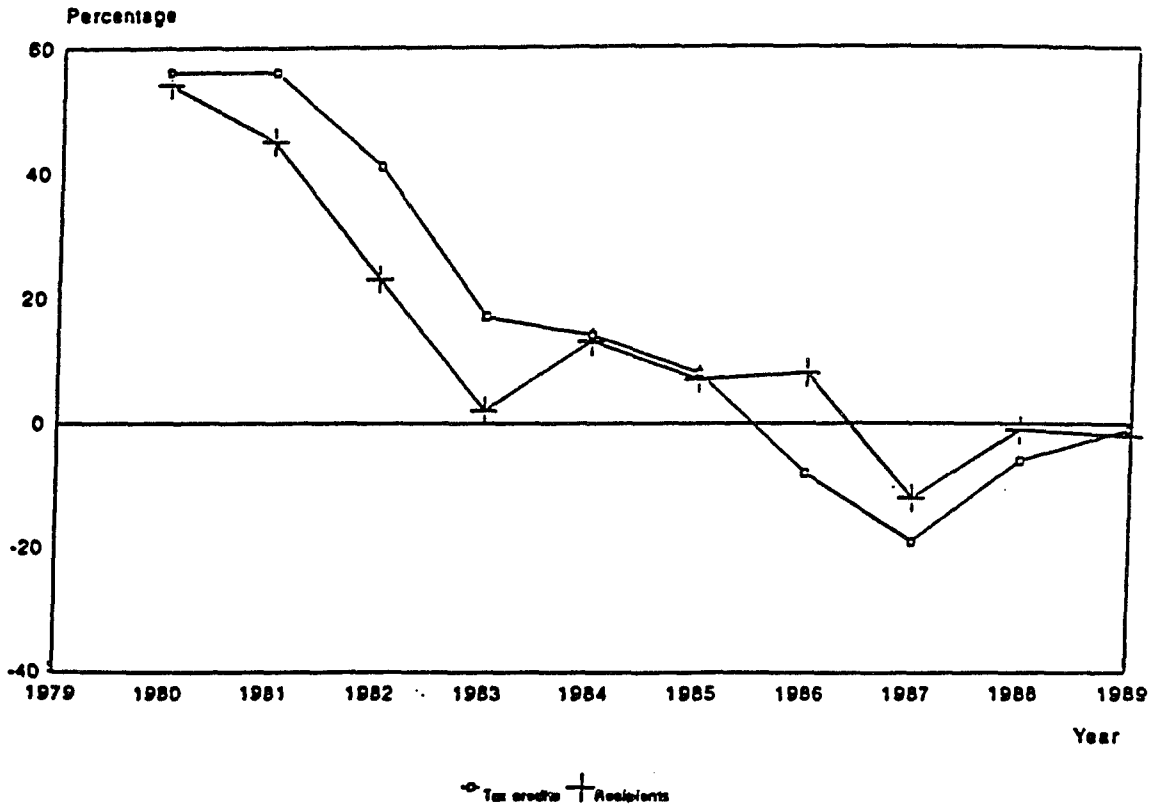
Fourth, both PA 116 credits and the number of recipients increased rapidly from 1979 to 1981 and declined significantly afterwards (Department of Treasury 1991). The percentage change shows that PA 116 credits decreased beginning 1986, while the number of recipients decreased the following year. In 1986, the number of recipients was still increasing, while the total amount of tax credits decreased. This reflects a time lag between the time when farmers decided to withdraw from the program and when they realized that incentives were fading (see Table 4 and Figure 4).

Table 4 PA 116: Tax Credits, the Number of Recipients (in thousands), and Percentage Change in Both Tax Credits and the Number of Recipients, Michigan, 1979-1989.

Year	Total Amount	% Change	Recipients	% Change
1979	15,577.2	___	5.4	___
1980	24,271.7	56	8.3	54
1981	37,950.3	56	12.0	45
1982	53,638.1	41	14.8	23
1983	62,981.3	17	15.1	2
1984	71,674.6	14	17.0	13
1985	77,568.3	8	18.2	7
1986	71,464.8	- 8	19.6	8
1987	58,215.7	-19	17.3	-12
1988	54,932.5	- 6	17.1	- 1
1989	54,294.9	- 1	16.7	- 2

Source: Department of Treasury, 1991.

Figure 4 PA 116: Percentage Change of Tax Credits and Recipients, Michigan, 1979-1989



Source: Department of Treasury, 1991.

Fifth, attractive prices for land may have contributed to reduced enrollment, especially in urban fringe areas. Increased land prices were partly due to population migration to rural areas (the rurban phenomenon) which increased demand for farmland. Rural population represented 26 percent of the total population in Michigan in 1970. By 1980, rural population represented 29 percent of the total population in Michigan (Michigan Department of Management and Budget, 1991).

As one farmer put it, land values, at the individual farm level, were showing signs of increasing faster than the income level to support the purchases (Hanson and Kelsey, 1991). While the state's average purchase price per acre was $975[19] for higher quality land (prime farmland) in 1991, some parcels of less than 20 acres were selling in the range of $2000 to $5000 ($1570 to $3920 in real values) per acre. Woods and stream or ponds pushed sales over $10,000 ($7840 in real value) per acre in the same year (Hanson and Kelsey, 1991).

In general, however, the statewide average real values of land per acre decreased during the period 1978-1990. They dropped significantly since 1982 (USDA, 1985; Michigan Agricultural Statistics Service, 1990; Table 5; Figure 5).

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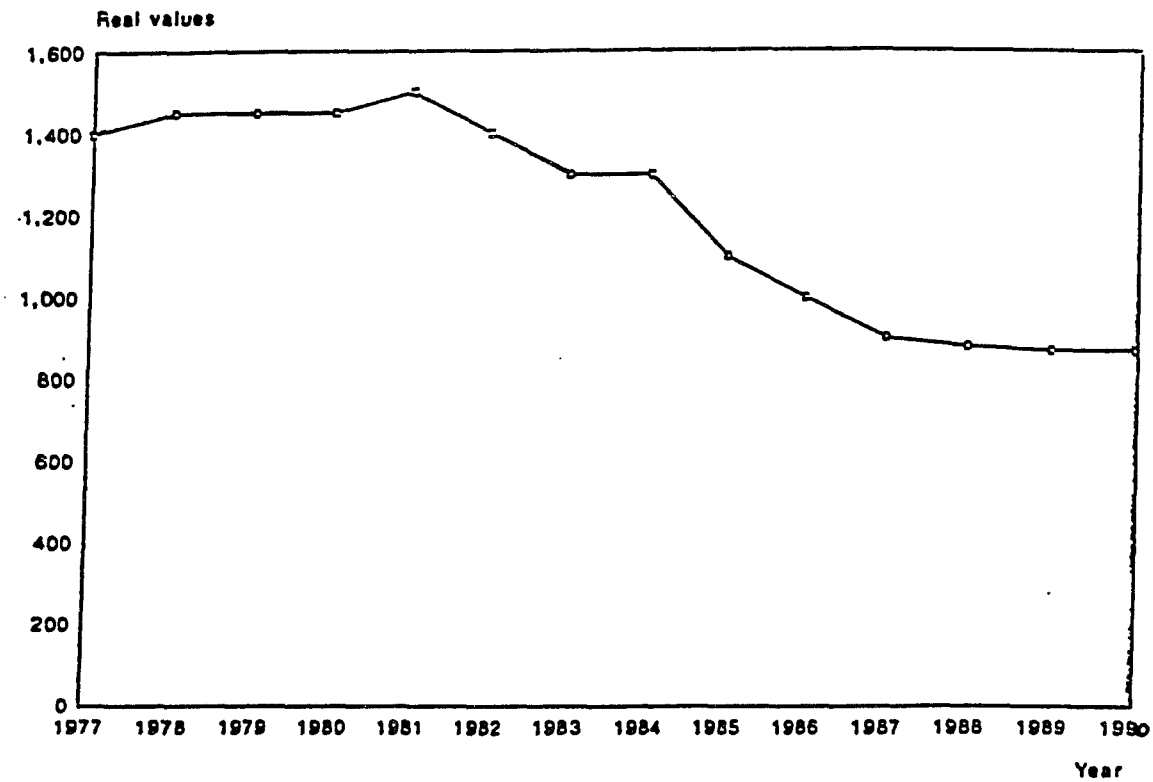
[19] $975 are equal to $7.6 in real values (1985 = 100). Real value = (nominal value/consumer price index)*100 (Appendices 4 & 5). The purchase price per acre (gross sale price per acre) is equal to sale price/total acres.

Table 5 Average real Values of Farmland (rounded) per Acre ($), and Percentage Change, Michigan, 1977-1990 (1985 = 100)

Year	Real Values	% Change
1977	1400	___
1978	1450	4
1979	1450	0
1980	1450	0
1981	1500	3
1982	1400	- 7
1983	1300	- 7
1984	1300	0
1985	1100	-15
1986	1000	- 9
1987	900	-10
1988	880	- 2
1989	870	- 1
1990	870	0

Source: USDA, 1985.
Michigan Agricultural Statistics Service, 1990.

Figure 5 Average Real Values of Farmland per Acre ($), Michigan, 1977-1990 (1985=100)



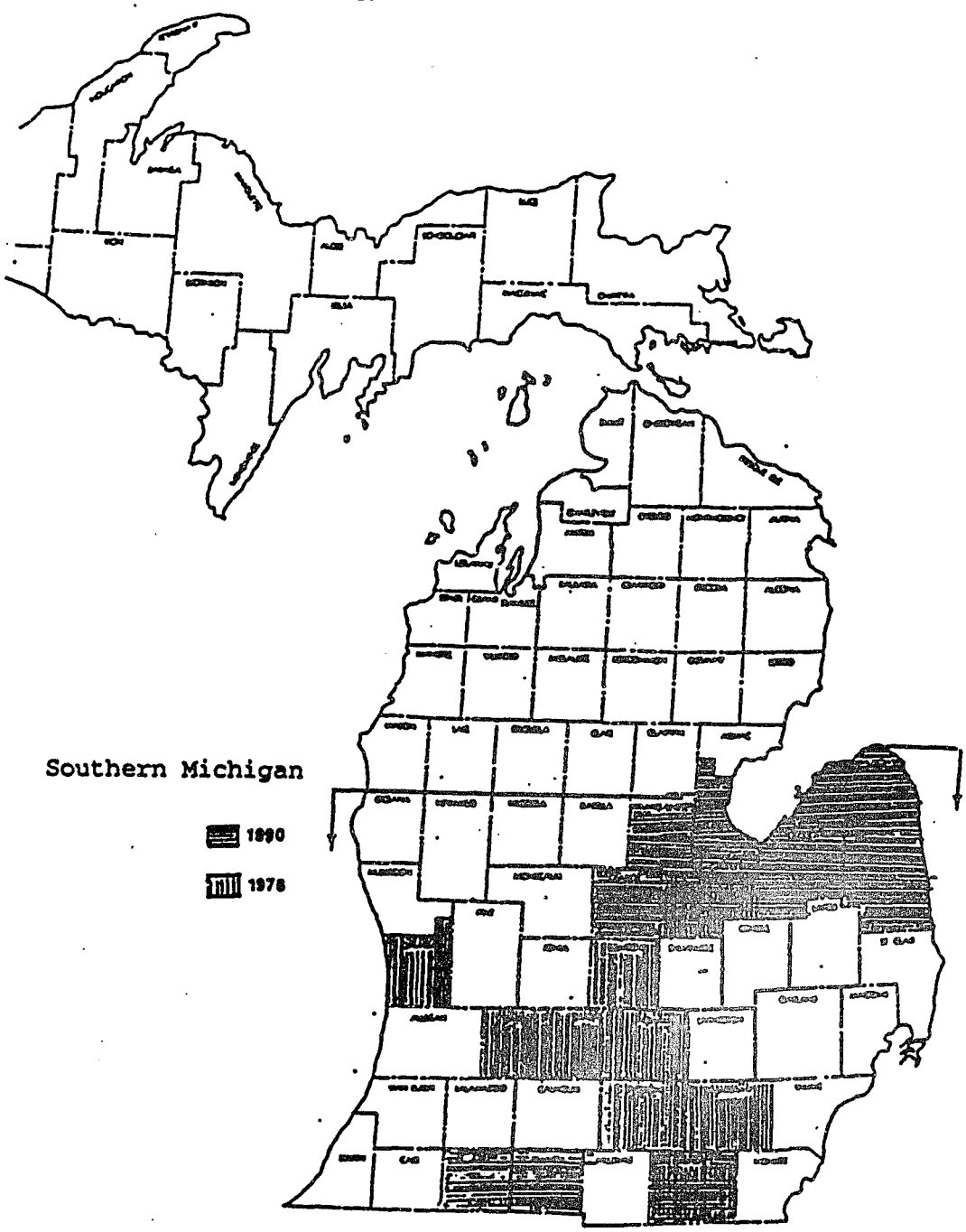
Source: USDA, 1985; Michigan Agricultural Statistics Service, 1990.

In brief, the statewide number of contracts, the acreage enrolled, and tax credits decreased sharply after 1982, corresponding to about the first 10 year minimum length of time of a contract (see Tables 2, 3, 4, and Figures 2, 3,4). At the same time, farmland values decreased (see Table 5 and Figure 5). It looks like the year of 1982 was a saturation point for enrollment at the state level.

VI.1.2. At the County Level

First, the counties with the largest number of acres enrolled in 1976 were, in decreasing order: Ingham, Clinton, Lenawee, Saginaw, Washtenaw, Jackson, Eaton, Iosco, Ottawa and Barry (Cochran, J.M., 1976; Map 3). In 1990, the counties with the highest percentage of farmland enrolled were: Huron, Gratiot, Tuscola, Saginaw, Bay, Sanilac, and Midland, in the Thumb area, and Lenawee, Saint Joseph, and Branch in the southern part of Michigan (Harvey et al., 1991; Map 3).

Map 3 Counties Leading in Enrollment, Southern Michigan, 1976 and 1990



Source: - Cochran, J., 1976
- Harvey, L.R. et al., 1991

The total acreage in farms, one the one hand, increased from 1974 to 1982. It decreased from 1982 to 1987, except for Ionia, Midland and Oceana. The acreage enrolled, on the other hand, increased at an increasing rate from 1978 to 1982, and increased at a decreasing rate from 1982 to 1987 statewide (see Table 6).

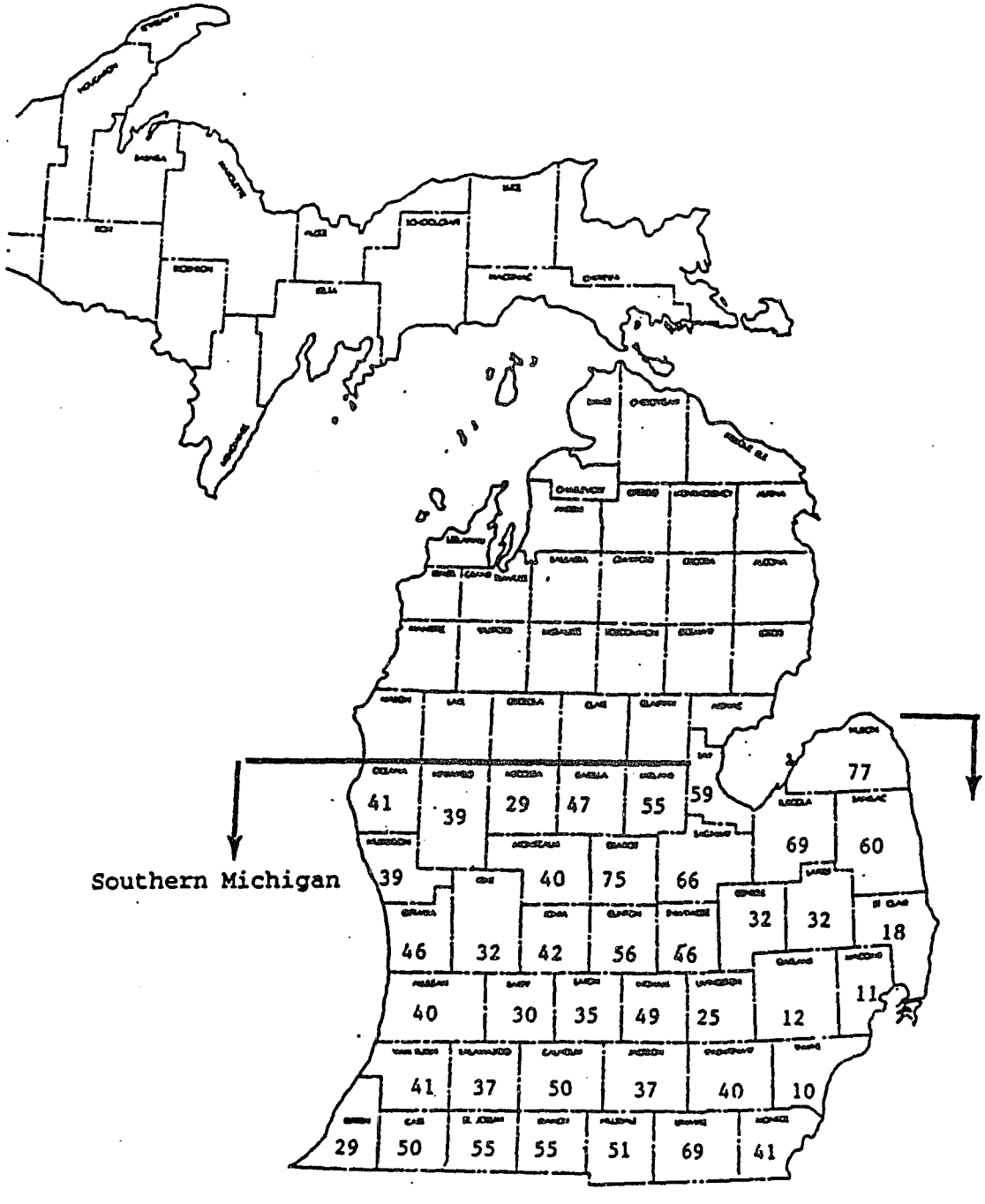
Thirty four percent of the counties in southern Michigan experienced a cumulative enrollment of at least 50 percent of land in farms in 1990. The remaining 66 percent had an enrollment of less than 50 percent. Among the last category, Ingham, Isabella, Shiawassee, and Ottawa counties had the highest enrollment. More urban counties, located in Detroit area, Battle Creek area, Flint area, Muskegon and Benton-Harbor areas enrolled less than 45 percent of their land in farms. The lowest enrollment was observed in Wayne county (10%). The highest enrollment was observed in Huron county. (DNR, 1990; Map 4).

Table 6 Land in Farms (acres) and Acreage Enrolled (cumulative) per County for Selected Years

County	Land in farms (a)				Acreage enrolled (b)		
	1974	1978	1982	1987	1978	1982	1987
Allegan	260,000	261,000	267,000	254,000	4,319	63,171	97,090
Barry	185,000	181,000	188,000	168,000	13,573	36,083	48,456
Bay	167,000	184,000	180,000	177,000	6,431	71,702	102,910
Berrien	196,000	197,000	190,000	180,000	1,986	28,000	49,772
Branch	216,000	242,000	243,000	227,000	15,388	86,312	121,143
Calhoun	271,000	256,000	267,000	253,000	14,439	75,886	123,900
Cass	196,000	199,000	199,000	194,000	11,151	56,980	92,521
Clinton	262,000	260,000	267,000	253,000	39,681	109,425	132,900
Eaton	239,000	239,000	245,000	234,000	13,056	50,065	74,668
Genesee	149,000	157,000	161,000	145,000	6,531	29,305	42,935
Gratiot	282,000	280,000	289,000	282,000	39,261	168,539	208,949
Hillsdale	267,000	264,000	265,000	242,000	10,668	84,556	118,843
Huron	410,000	405,000	435,000	424,000	74,591	254,963	318,498
Ingham	227,000	226,000	223,000	208,000	37,162	80,856	92,457
Ionia	251,000	244,000	243,000	254,000	9,583	64,152	103,112
Isabella	204,000	202,000	201,000	195,000	5,476	40,939	86,753
Jackson	245,000	242,000	235,000	218,000	11,899	59,130	75,520
Kalamazoo	171,000	175,000	177,000	168,000	2,847	41,057	60,498
Kent	226,000	230,000	223,000	204,000	11,450	43,962	64,379
Lapeer	224,000	233,000	226,000	219,000	5,395	40,476	66,166
Lenawee	373,000	374,000	376,000	345,000	52,189	183,966	223,675
Livingst.	141,000	136,000	138,000	129,000	2,660	21,683	31,157
Macomb	89,000	89,000	91,000	80,000	215	5,235	8,614
Mecosta	126,000	140,000	136,000	127,000	4,876	26,647	32,148
Midland	88,000	94,000	93,000	94,000	9,056	32,418	50,473
Monroe	232,000	232,000	242,000	220,000	3,867	66,456	86,568
Montcalm	240,000	243,000	241,000	238,000	3,811	49,267	87,895
Muskegon	82,000	87,000	85,000	82,000	6,269	23,174	29,150
Newaygo	127,000	133,000	129,000	116,000	730	27,315	42,686
Oakland	87,000	77,000	69,000	60,000	3,354	4,830	7,288
Oceana	126,000	126,000	130,000	133,000	6,262	26,021	52,972
Ottawa	174,000	191,000	183,000	178,000	10,287	62,349	80,964
Saginaw	333,000	335,000	323,000	308,000	51,320	146,398	195,082
StClair	202,000	206,000	206,000	177,000	1,875	16,075	30,075
StJoseph	226,000	223,000	221,000	214,000	3,713	80,745	112,069
Sanilac	421,000	448,000	444,000	431,000	19,469	166,772	251,263
Shiawass.	242,000	252,000	244,000	240,000	9,815	76,528	103,296
Tuscola	335,000	345,000	344,000	329,000	72,696	172,004	220,931
Van Buren	213,000	206,000	197,000	190,000	9,643	46,451	75,837
Washtenaw	226,000	235,000	224,000	205,000	8,801	56,276	76,360
Wayne	37,000	33,000	37,000	22,000	470	1,216	2,209

Source: (a) Census of Agriculture 1974, 1978, 1982 and 1987.
(b) Harvey and Trachtenberg, 1990.

Map 4 Percentage (accumulated) of Farmland Enrolled, Southern Michigan, 1990.



Source: DNR, 1990

Second, farmland agreements increased between the period of 1975 to 1982 and decreased sharply afterward in most counties. About 25% of counties continued to have an increase in agreements up to 1983. These were: Calhoun, Hillsdale, Ingham, Ionia, Kalamazoo, Kent, Mecosta, Midland, Oakland and Oceana. After 1985, enrollment in the program was weaker than before in all the counties (see Appendix 3).

Third, PA 116 credits as a percentage of the total agricultural property taxes followed the same pattern of enrollment. Western counties such as Kent, Ottawa, Muskegon and Oceana, along with those located in the Thumb area and in the southern part of Michigan, received a relatively higher percentage of property tax refunds than other counties. Counties with the lowest percentage of PA 116 with respect to total property taxes are in Detroit area: Wayne, Oakland, Macomb, Livingston, and Saint Clair (see Table 7).

Table 7 PA 116 Credits, and as a Percentage of Total Property Taxes by County, Southern Michigan, 1983-1985 and 1987

County	PA 116 Credits				Percentage			
	1983	1984	1985	1987	1983	1984	1985	1987
Allegan	740,400	1,065,000	1,206,700	1,294,000	10	14	15	17
Barry	382,700	493,300	370,000	404,200	8	11	8	11
Bay	2,539,000	2,794,000	2,725,000	1,441,000	31	34	34	24
Berrien	1,215,000	1,039,000	946,700	867,300	19	17	16	19
Branch	1,230,000	1,039,000	1,345,000	1,216,000	21	17	23	21
Calhoun	1,308,000	1,084,000	1,261,000	1,067,000	20	17	23	21
Cass	971,400	1,183,000	977,600	1,129,000	18	23	18	23
Clinton	1,531,000	1,924,000	2,623,000	1,769,000	19	24	31	27
Eaton	967,900	1,337,000	1,396,000	1,180,000	15	21	21	19
Genesee	892,500	946,800	916,900	846,500	14	15	15	14
Gratiot	4,300,000	4,565,000	5,447,000	2,367,000	46	49	58	38
Hillsdale	1,293,000	1,680,000	1,213,000	811,200	20	26	23	26
Huron	5,209,000	6,475,000	6,795,000	5,078,000	40	50	50	45
Ingham	2,269,000	1,921,000	1,780,000	1,936,000	30	26	23	26
Ionia	959,700	1,211,000	1,377,000	1,044,000	18	22	25	20
Isabella	560,900	715,800	879,500	624,600	11	14	18	15
Jackson	829,200	769,800	867,500	779,800	11	10	11	11
Kalamazoo	989,400	1,315,000	1,063,000	1,108,000	20	27	22	25
Kent	1,139,000	1,178,000	1,527,000	1,366,000	28	29	37	33
Lapeer	650,500	825,800	667,400	544,200	9	12	9	8
Lenawee	4,756,000	5,080,000	6,037,000	4,202,000	35	38	46	39
Livingston	265,700	425,300	504,800	213,600	5	8	10	5
Macomb	77,000	197,000	181,100	311,800	1	3	3	6
Mecosta	135,600	275,800	266,700	138,300	6	12	12	6
Midland	519,300	395,000	388,500	473,200	19	15	14	24
Monroe	1,683,000	1,804,000	1,266,000	1,284,000	17	18	13	15
Montcalm	892,300	1,062,000	1,086,000	1,317,000	18	21	21	27
Muskegon	636,700	663,600	655,200	297,500	30	31	32	15
Newaygo	383,000	528,000	661,000	348,500	13	18	23	12
Oakland	286,800	208,500	436,700	280,200	3	2	2	4
Oceana	344,300	597,700	525,800	791,200	16	28	24	33
Ottawa	1,576,000	1,456,000	1,662,000	1,848,000	24	22	24	25
Saginaw	5,455,000	5,662,000	5,854,000	3,810,000	37	38	39	33
StClair	219,000	187,100	215,900	370,100	2	2	2	4
StJoseph	1,747,000	1,939,000	2,321,000	1,280,000	29	33	39	25
Sanilac	2,460,000	2,435,000	3,645,000	2,454,000	24	24	35	29
Shiawassee	1,468,000	1,392,000	1,928,000	1,550,000	21	20	28	23
Tuscola	5,198,000	5,935,000	6,549,000	3,784,000	40	46	47	40
Van Buren	1,203,000	746,000	858,500	511,000	22	14	15	11
Washtenaw	1,624,000	2,157,000	2,002,000	1,369,000	16	21	19	14
Wayne	394,300	364,900	498,900	84,500	26	24	32	6

Note: Numbers are rounded.
Source: Michigan Department of Treasury: Taxation and Economic Policy Office, 1985, 1986, 1986-87 and 1990.

Fourth, the average real values of farmland per acre increased during the period 1964-1978 and decreased during the period 1982 - 1987, except for Wayne county. Bay, Newaygo and Saginaw counties continued to experience an increase in real values of land until 1982 (see Table 8).

The percentage change indicates that the real values of farmland increased in more rural counties, located especially in the Thumb area, during the period 1974-1982. At the same time, more urban counties, located mainly in Detroit area, experienced a decrease in real farmland values. During the period 1982-1987, the real values of farmland decreased in all the counties (except Wayne county), especially in the Thumb area.

Major increase of real values of land prior to PA 116 occurred in the following counties: Livingston (109%), StClair (106%), Lapeer (86%), Mecosta (83%), Newaygo (80%), oakland (66%), Oceana (66%), Sanilac (65%), Cass (62%) and Washtenaw (62%) (see Table 8 and Map 5). Apart from Washtenaw county, none of these counties was leading in enrollment in 1976 (Map 3). During the period 1974-1982, corresponding to about the first 10 year of the minimum length of contracts, there was moderate land appreciation and a geographic change in land values. Major increase in real farmland values took place especially in the Thumb area: Gratiot (52%), Huron (51%), Bay (48%), and Midland

Table 8 Average Real Values (rounded) of Land and Building per Acre per County, Southern Michigan, 1964 - 1987 (1985=100) and Percentage Change During the Periods 1964-1974, 1974-1982, and 1982-1987

County	1964	1969	1974	1978	1982	1987	64-74 (%)	74-82 (%)	82-87 (%)
Allegan	830	930	1,240	1,700	1,460	1,100	49	18	- 25
Barry	620	710	970	1,290	990	860	56	2	- 13
Bay	1,380	1,300	1,470	2,030	2,180	1,120	7	48	- 49
Berrien	1,640	1,530	1,640	2,010	1,670	1,100	0	2	- 34
Branch	740	770	990	1,330	1,120	740	34	13	- 34
Calhoun	720	770	960	1,290	1,080	680	33	18	- 37
Cass	710	890	1,150	1,670	1,330	900	62	16	- 32
Clinton	850	970	1,170	1,500	1,310	890	38	12	- 32
Eaton	810	910	1,150	1,490	1,310	820	42	14	- 37
Genesee	1,200	1,590	1,730	2,060	1,420	1,160	44	18	- 18
Gratiot	1,080	1,010	1,170	1,630	1,780	780	8	52	- 56
Hillsda.	660	810	1,050	1,550	1,300	790	59	24	- 39
Huron	840	910	1,160	2,030	1,750	950	38	51	- 46
Ingham	1,040	1,170	1,440	1,740	1,480	1,050	39	3	- 29
Ionia	670	820	1,000	1,390	1,140	810	49	14	- 29
Isabella	670	720	910	1,230	1,100	640	36	21	- 42
Jackson	710	860	1,110	1,410	1,190	820	56	7	- 31
Kalamaz.	990	1,210	1,490	1,870	1,450	1,170	51	- 3	- 19
Kent	900	1,100	1,360	1,750	1,610	1,210	51	18	- 25
Lapeer	840	1,250	1,560	2,040	1,510	1,060	86	- 3	- 30
Lenawee	1,100	1,310	1,500	2,170	1,650	1,130	36	10	- 32
Livings.	920	1,390	1,920	2,130	1,550	1,260	109	-19	- 19
Macomb	1,800	2,600	2,660	3,060	2,180	1,910	48	-18	- 12
Mecosta	350	460	640	1,080	880	640	83	38	- 27
Midland	750	950	1,150	1,770	1,590	900	53	38	- 43
Monroe	1,530	1,670	1,980	2,610	1,900	1,290	29	- 4	- 32
Montcalm	550	590	790	1,230	960	700	44	22	- 27
Muskegon	820	910	1,050	1,450	1,360	950	28	30	- 30
Newaygo	510	600	920	1,060	1,220	760	80	33	- 38
Oakland	1,840	2,860	3,060	3,580	2,890	2,280	66	- 6	- 21
Oceana	530	710	880	1,190	1,250	940	66	42	- 25
Ottawa	1,200	1,380	1,620	2,000	1,930	1,660	35	19	- 14
Saginaw	1,170	1,300	1,510	1,810	1,830	990	29	21	- 46
StClair	790	1,140	1,630	1,820	1,280	1,040	106	21	- 19
StJoseph	760	790	1,010	1,640	1,420	980	33	41	- 31
Sanilac	690	780	1,140	1,540	1,230	720	65	8	- 41
Shiawas.	920	1,160	1,260	1,440	1,340	830	37	6	- 38
Tuscola	1,200	1,230	1,480	2,230	1,920	950	23	30	- 51
VanBuren	950	1,080	1,340	1,710	1,620	1,060	41	21	- 35
Washten.	1,160	1,470	1,880	2,290	1,860	1,440	62	- 1	- 23
Wayne	1,730	1,970	4,510	4,150	2,950	1,170	21	-35	- 14

Source: Census of Agriculture 1987, 1982, and 1974.

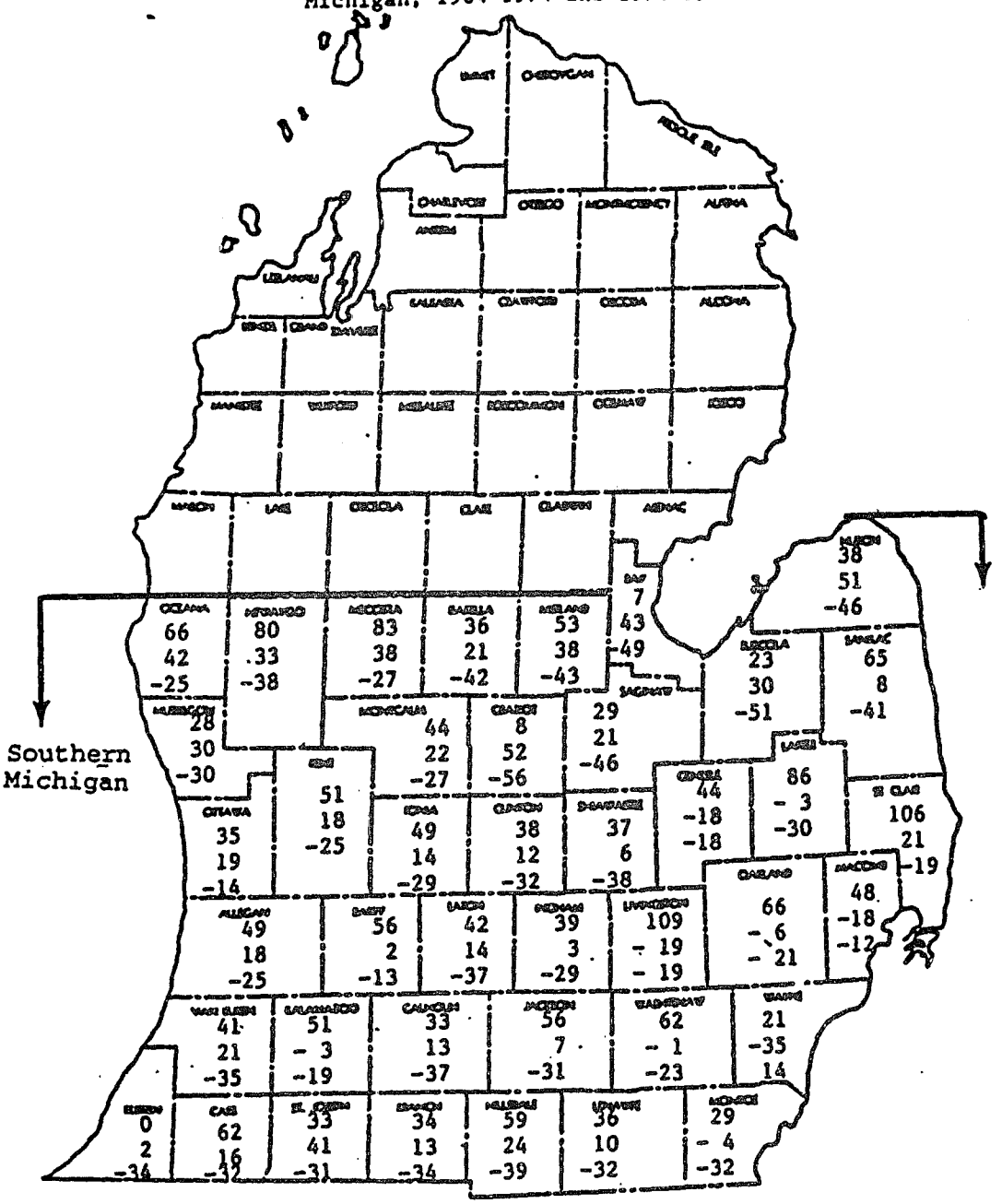
(38%). Elsewhere in southern Michigan, Oceana (42%), St Joseph (41%), and Montcalm (38%) were the counties which experienced a major increase in real farmland values.

On the contrary, land depreciated in urban counties during the same period. Real farmland values decreased mainly in Wayne (35%), Livingston (19%), Genesee (18%), and Macomb (18%). During the period 1982-1987, major decrease in real farmland values took place in the following counties: Gratiot (56%), Tuscola (51%), Bay (49%), Huron (46%), Saginaw (46%), Midland (43%), Isabella (42%), and Sanilac (41%) (Table 8 and Map 5).

One of the explanations of the decrease in real farmland values in more agricultural counties may be the fact that land, which was considered as a hedge against inflation in early 1970s, was no longer a major means of investment in the 1980s. On the other hand, cheaper land would attract urbanites who would convert it into non-agricultural activities. Therefore, a decrease in real farmland values may lead to increased farmland conversion to non-farm activities.

Another observation is the positive correlation between the real farmland values and incentives. PA 116 credits increased or decreased when the real farmland values increased or decreased. That is, a decrease in real farmland values results in a decrease in enrollment. More

Map 5 Percentage Change in Farmland Real Values, Southern Michigan, 1964-1974 and 1974-1982.



Note: The number on the top represents the change during the period 1964-1974. The second number represents the change during the period 1974-1982. The third number represents the change during the period 1982-1987.

Source: Census of Agriculture 1987, 1982, and 1974.

urban counties experienced higher farmland values prior to 1974 (Table 8 and Map 5). These land values have dropped since then.

VI.2. The Rate of Enrollment

The rate of enrollment increased from 1978 to 1982 and started to decrease afterwards in all counties, except Wayne county, where the rate of enrollment increased more during 1982-1987 period than during 1978-1982 period (see Table 9). The percentage change shows also that the rate of enrollment in 1987 was high in the eastern and in the western coasts of Michigan, as well as in counties bordering the State of Ohio, the northern part of southern Michigan, and in three counties neighboring Detroit area.

The counties presenting the lowest rate enrollment by 1987 were Wayne (10%), Macomb (11%), Oakland (12%) and StClair (17%). They represent the low enrollment counties. The counties that presented the highest rate of enrollment in the same period were Huron (75%), Gratiot (74%), Tuscola (67%) and Lenawee (65%). They represent the high enrollment counties.

Table 9 The Rate of Enrollment (%) for Selected Years, and Percentage Change 1978-1982 and 1982-1987, Southern Michigan

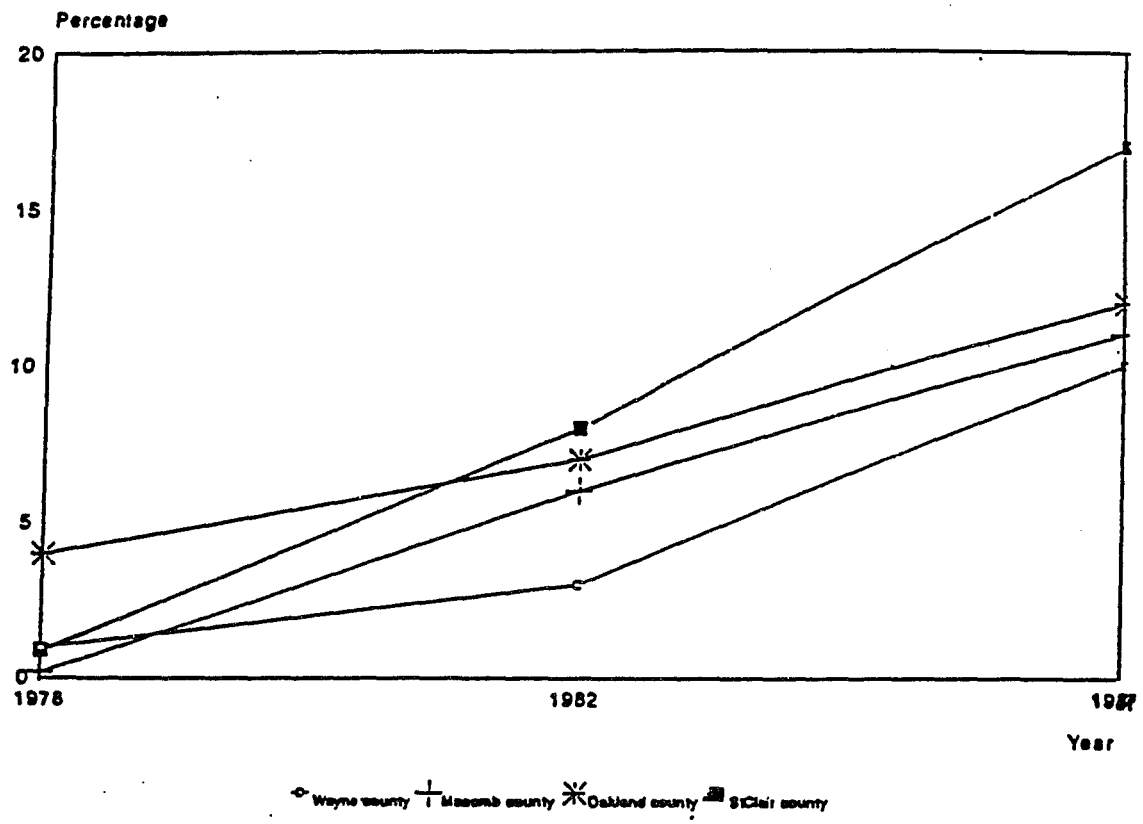
County	1978	1982	1987	Percentage change 1978-1982	1982-1987
Allegan	2	24	38	1100	58
Barry	8	19	29	138	53
Bay	3	40	58	1233	45
Berrien	1	15	28	1400	87
Branch	6	36	53	500	47
Calhoun	6	28	49	367	75
Cass	6	29	48	383	66
Clinton	15	41	52	173	27
Eaton	5	20	32	300	60
Genesee	4	18	30	350	67
Gratiot	14	58	74	314	28
Hillsdale	4	26	41	550	58
Huron	18	59	75	228	27
Ingham	16	36	44	125	22
Ionia	4	26	41	550	58
Isabella	3	20	44	567	120
Jackson	5	25	35	400	40
Kalamazoo	2	23	36	1050	57
Kent	5	20	32	300	60
Lapeer	2	18	30	800	67
Lenawee	14	49	65	250	33
Livingston	2	16	24	700	50
Macomb	0.2	6	11	2900	83
Mecosta	3	20	25	567	25
Midland	10	35	54	250	54
Monroe	2	27	39	1250	44
Montcalm	2	20	37	900	85
Muskegon	7	27	36	286	33
Newaygo	0.5	21	37	4100	76
Oakland	4	7	12	75	71
Oceana	5	20	40	300	100
Ottawa	5	34	45	580	32
Saginaw	15	45	63	200	40
StClair	0.9	8	17	789	113
StJoseph	2	37	52	1750	41
Sanilac	4	38	58	850	53
Shiawassee	4	31	43	675	39
Tuscola	21	50	67	138	34
VanBuren	5	24	40	380	67
Washtenaw	4	25	37	525	48
Wayne	1	3	10	200	233

Note: The rate of enrollment is computed from Table 6.
Source: Census of Agriculture 1978, 1982 and 1987; Harvey and Trachtenberg, 1990.

VI.2.1. Adoption Behavior in Low Enrollment Counties

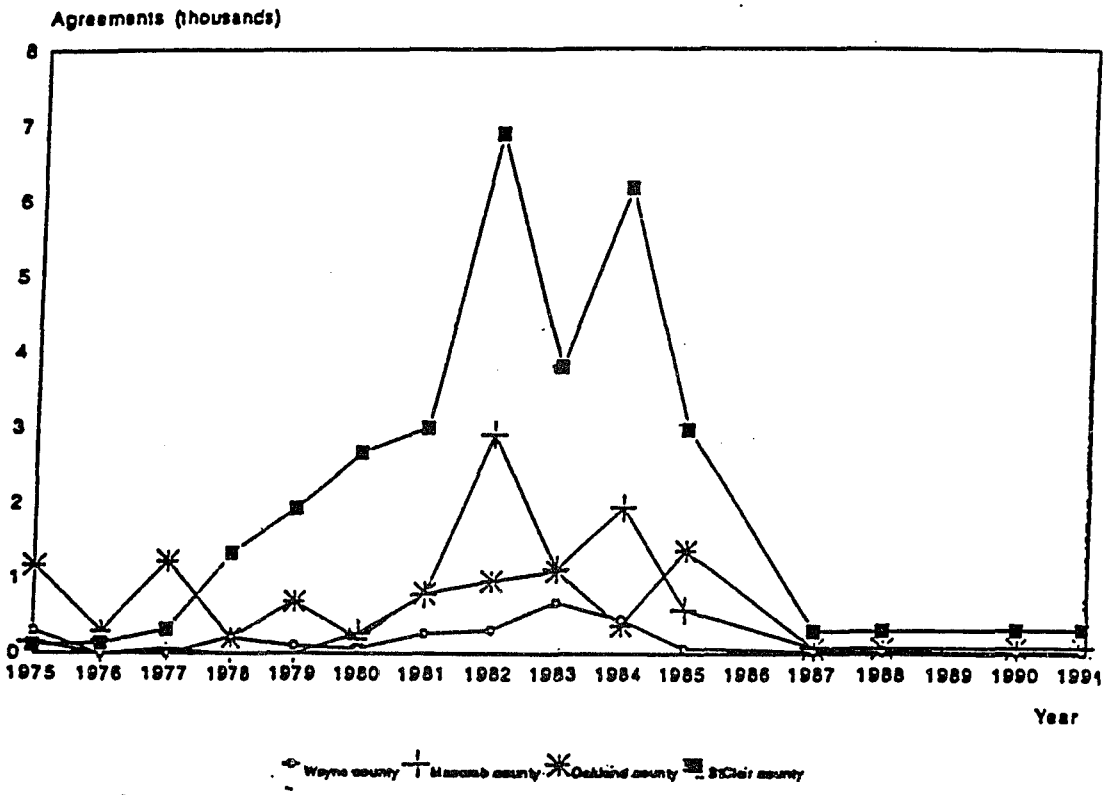
By plotting the rate of enrollment, it is seen that, overall, low enrollment counties experienced growing enrollment at a decreasing rate between 1978 and 1982. Enrollment was increasing at a higher rate since then (see Figure 6). That is, the first stage of enrollment, the period of slow increase in adopting the program, went up to 1982 in low enrollment counties. Landowners were not motivated enough to widely adopt the program. The annual agreements indicate that the turning point was in 1981 (see Figure 7).

Figure 6 Adoption Behavibr in Low Enrollment Counties
(using the rate of enrollment)



Source: Census of Agriculture, 1978, 1982 and 1987; Harvey and Trachtenberg, 1990

Figure 7 Adoption Behavior in Low Enrollment Counties
(using agreements)



Source: Michigan Department of Natural Resources, Farmland and Open Space Unit, 1992.

The second stage, the period of extensive adoption of the program, corresponding to the portion from the turning point to the saturation point, where enrollment is stagnant, consists of growing enrollment at an increasing rate. The turning point was in 1982. The saturation point occurred after 1987. The annual agreements, however, show that this stage was between 1981 and 1983. The saturation point was reached in 1982. Landowners may have enrolled larger portions of their land up to 1982 and started to enroll smaller plots since then.

The third stage corresponds to the period where the curve starts to decline. After the saturation point in 1982, enrollment in the program started to decreased.

In low enrollment counties, in general, the turning point occurred early 1980. It took landowners about five years to enroll more land in PA 116. The saturation point, however, was reached in a very short time. The year of 1982 represents a maximum land enrollment in most low enrollment counties, which are mainly urban. PA 116 credits were relatively low in those counties (Table 7). The year of 1982 is also a period where real farmland values and land in farms started to decrease (Tables 6 and 8).

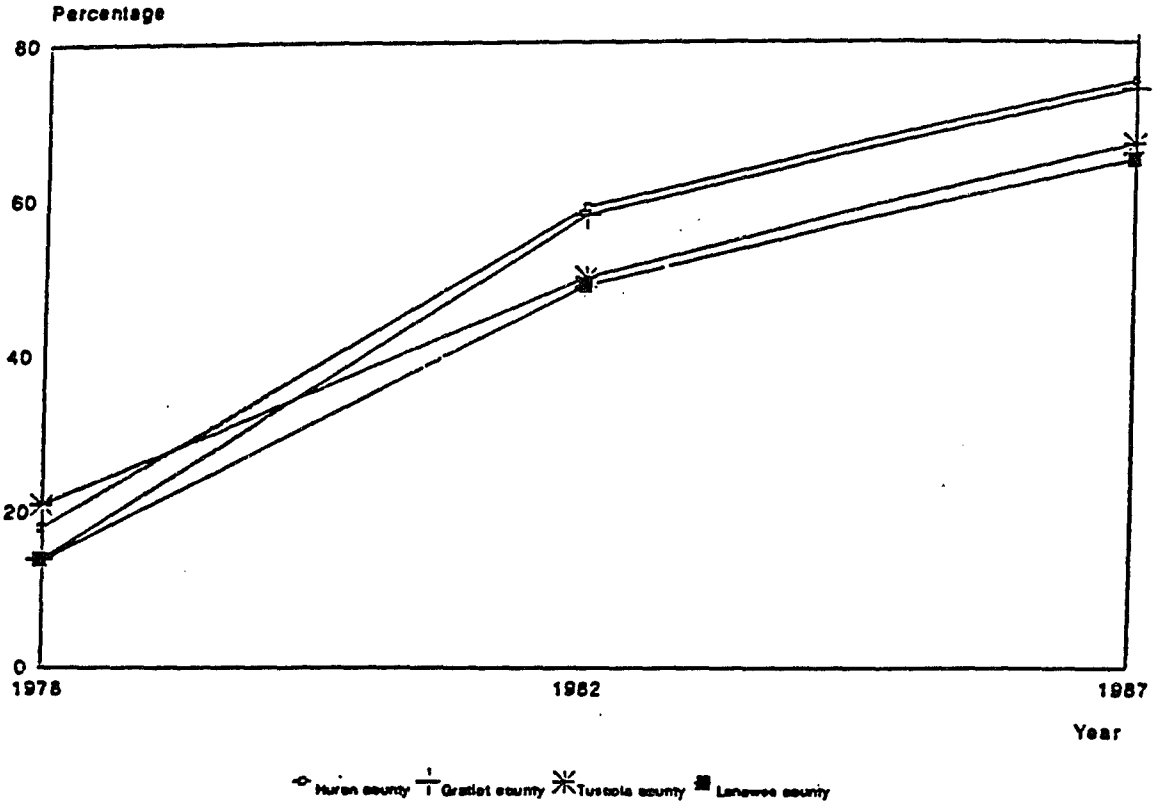
VI.2.2. Adoption Behavior in High Enrollment Counties

The rate of enrollment in high enrollment counties indicates that the turning point in the adoption of the program took place prior to 1978 (Figure 8). The annual agreements show that the turning point was in 1976 (Figure 9). It took landowners a very short time to decide to enroll their land. The year of 1976 corresponds to the period where the Thumb area started to lead in enrollment.

The saturation point was reached before 1982. Both the rate of enrollment and annual agreements indicate that enrollment grew at an increasing rate up to 1979 and started to increase at a declining rate up to 1982. Enrollment declined since 1982 (Figure 9). The rate of enrollment, however, shows that enrollment grew at a decreasing rate until 1987 (Figure 8). Once more, farmers may have enrolled smaller portions of their land after 1982. The third stage in high enrollment counties occurred around 1982.

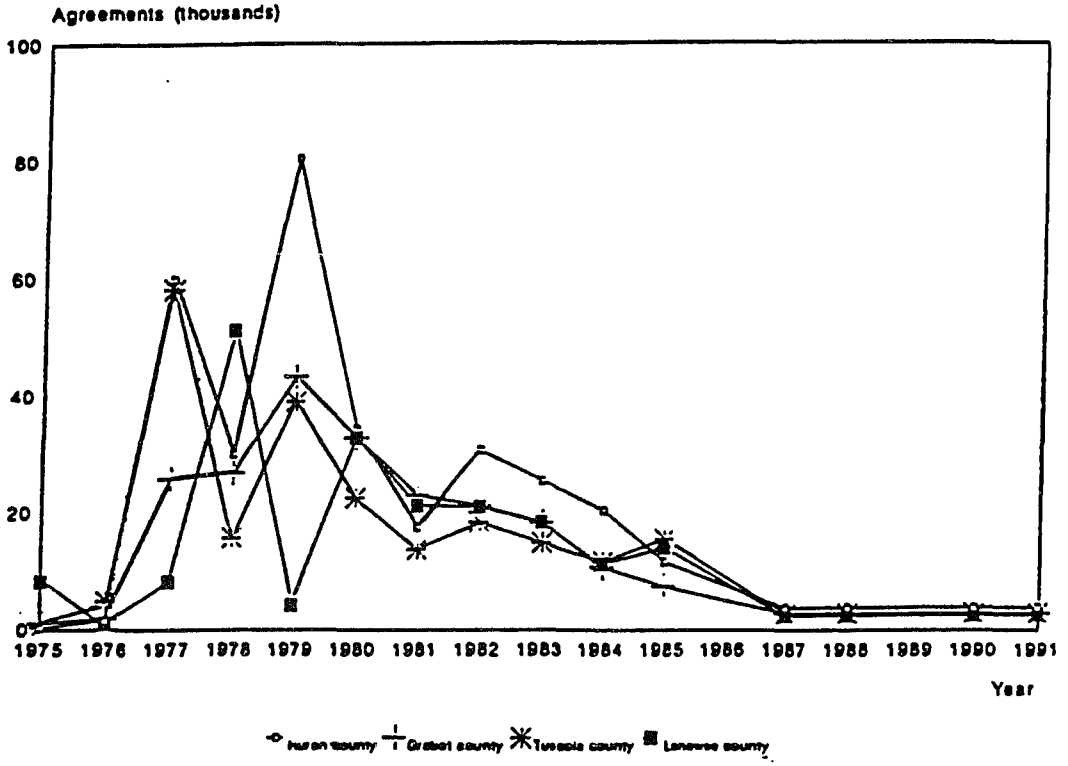
In high enrollment counties, in general, farmers adopted the program early. The extensive adoption of the program slowed down after the first 10 year minimum time required for enrollment. High enrollment counties are mainly rural. PA 116 credits were still relatively high until 1985 (Table 7). Real farmland values and land in farms, however, started to decrease in 1982 (Tables 6 and 8).

Figure 8 Adoption Behavior in High Enrollment Counties
(using the rate of enrollment)



Source: Census of Agriculture, 1978, 1982 and 1987; Harvey and Trachtenberg, 1990

Figure 9 Adoption Behavior in High Enrollment Counties
(using agreements)



Source: Michigan Department of Natural Resources, Farmland and Open Space Unit, 1992.

VI.3. Characteristics of Enrollment

The following were the characteristics of enrollment in PA 116. The Thumb area and counties at the border with the State of Ohio, which constitute the more rural counties, had a high rate of enrollment, whereas more urban counties had the lowest rate of enrollment (see Table 9). Prior to the enactment of PA 116, farmland values increased in more urban counties. They continued to increase until 1982 in more rural counties. PA 116 credits were the lowest in more urban counties. Therefore, PA 116 credits have not been competitive with land market prices in more urban counties.

According to Wright (1985), Huron, Sanilac, Tuscola, Gratiot, and Lenawee experienced the most increase in the number of farms of 500 acres or more during the period 1974-1982. Along with Saginaw county, they also had more acreage in farms than other counties in southern Michigan during the period 1974-1987 (see Table 6). These counties received a higher percentage of incentives offered by the program than others. Therefore, more rural counties benefitted the most from the program.

In addition to the amount of tax credits offered to farmers, the fear of building sites for waste disposal in some counties, like Lenawee, may have increased their enrollment (Michigan Farm Bureau, 1991; DNR, 1992).

Construction of economic infrastructure as well as projected construction of landfills may have contributed to increased enrollment in some counties because farmers would lose part of their agricultural land.

Low enrollment occurred in more urban counties, where farmland values are relatively high (Table 8) and where farms are divided into small plots. Small farmers predominate in the inner ring, while large farmers increase with increasing distance from the city (Mather, 1986). More urban counties experienced the most increase in the number of farms of less than 50 acres, especially Washtenaw, Oakland, Livingston, Ingham, and Lapeer during the period 1974-1982 (Wright, K. T., 1985). Petykiewicz (1987) also mentioned that in Jackson county, only 10 percent of the farmland located in areas where urban sprawl is a real problem, urban fringe areas, were enrolled in PA 116.

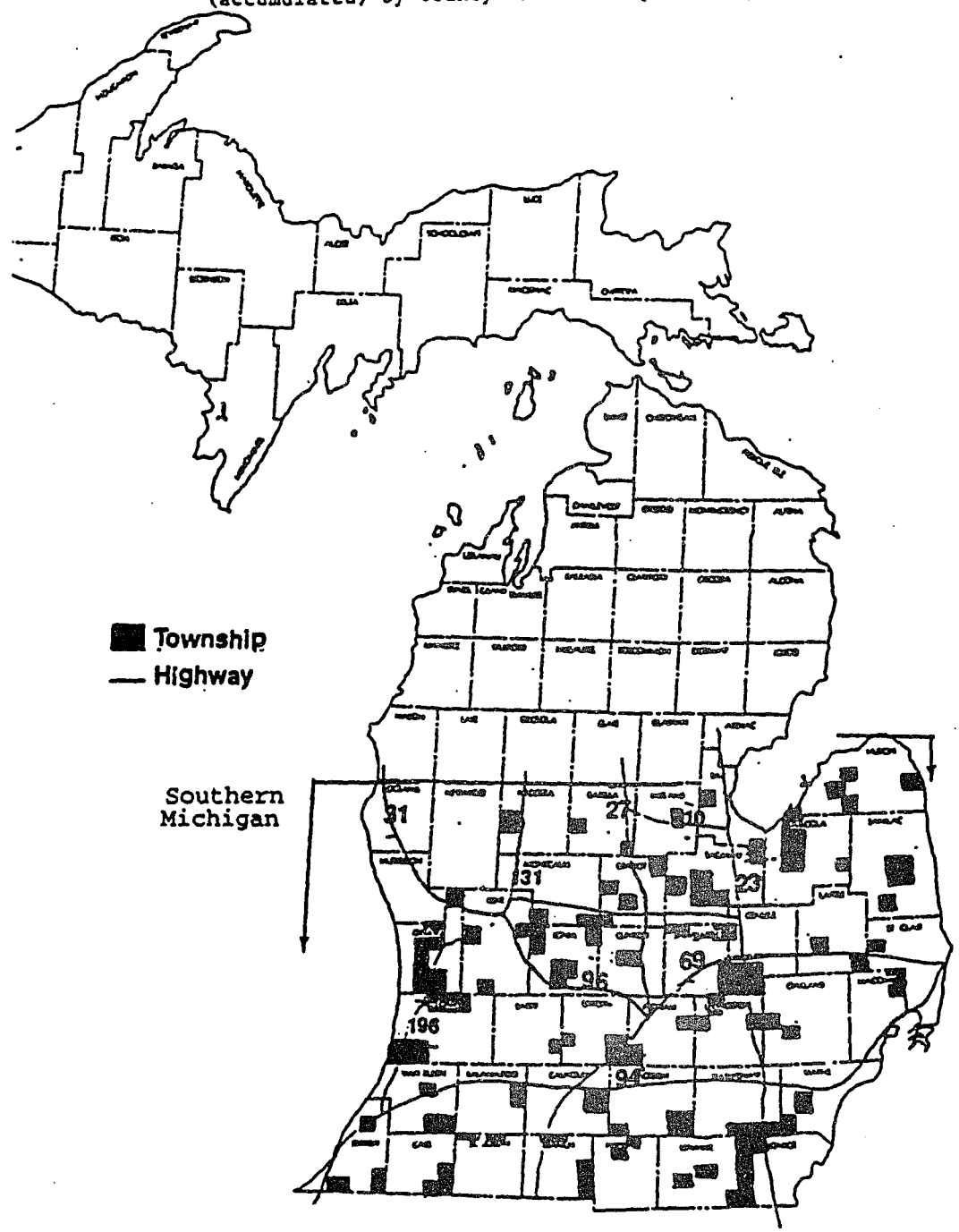
Incentives offered by the program did not constitute much of a relief from farm property taxes, at least in urban counties. The Department of Treasury (1985) noticed that PA 116 does not attract much land located at urban fringes. Farmers near cities would be keeping their options open for future economic opportunities (Misseldine, 1986).

VI.4. Contract Termination

The main counties where early termination of contracts took place (10 cases or more) were : Ottawa, Ionia, Monroe, Allegan, Calhoun, Genesee, Kent, Washtenaw, Saginaw, Lenawee, Sanilac, Hillsdale, Huron, Gratiot, Clinton and Berrien (see Map 6 and Appendix 4). Cases of early termination of the contract could be an indicator of development pressure which is occurring in almost all the southern Michigan[20].

[20] The number of cases of early termination per county as well as the length of contract of farmers who terminated and did not pay the lien are indicated in Appendices 4 and 5.

Map 6 Geographic Distribution of Early Termination of Contracts (accumulated) by County and Township, Michigan, 1991.



Source: DNR, 1991

In 80 percent of the cases of early termination, the length of the contract was less than 10 years (see Appendix 5)

Nearly 60 percent of these counties had moderate real farmland values (increase in land values around 30 percent). Half of them had an increase in population density during the period of 1974-1987 (Verway, 1978 and Appendices 9 and 10). Most of these counties were expecting some development to take place in 1990s (see Map 1). About 70 percent of these counties received PA 116 credits ranging from 15 to 30 percent of total farm property taxes during the period 1983-1987 (see Table 7).

A review of files of cases of early termination of contracts indicated that 83 percent of such cases were due to attractive land market prices. Insufficient information on the provisions of the program accounted for 17 percent. Farmers terminated their contracts thinking they could do so without any penalty. Cases of termination appear to have affected marginal farmers. Financial crisis represented 17 percent. Farmers had to sell their agricultural land to pay back their mortgage. According to the Farmers Home Administration (1991), 60 percent of cases of foreclosures each year[21] involve participants in PA 116 because of financial hardship. Hence, PA 116 credits alone do not secure farm profitability.

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[21] There are about 30 cases of foreclosures in the State of Michigan each year.

The same review of files indicated that nearly three percent of early termination of contracts took place in 1987, 12 percent in 1988, 30 percent in 1989, 52 percent in 1990, and three percent in 1991. In addition, 95 percent of early termination consists of participants whose enrollment started in the 1980s (DNR, 1991).

Early termination of contracts happened because of the attractiveness of land market prices brought about by urban-rural migration, which depreciated land in urban areas and appreciated farmland in rural areas. Most cases of early termination are found in counties expecting economic growth. Those counties also received relatively low PA 116 credits. About 30 percent of these counties had a relatively high percentage of PA 116 credits (at least 30 percent of total farm property taxes). Nearly 40 percent of these counties are urban or urbanizing counties. Consequently, the closeness of farms to urban areas does not necessary imply early withdrawal of farms. However, the more economic growth is expected in a given county, the more likely farmers are going to terminate their contracts.

Thirty nine percent of participants expected economic development to occur in more than 20 years (Frankel and Connor, 1988). As such, early termination is related more to expected economic infrastructure than to the current location of farms. In other words, cases of early

termination occur where potential land market prices are expected to be higher than PA 116 credits. Therefore, the retention of enrollment will take place if PA 116 credits increase to offset the impact of land market prices on the decision to sell agricultural land. Subsequently, the future of enrollment in PA 116 in more urban or urbanizing counties is not guaranteed. According to Frankel and Connor (1988), sales of enrolled farms were about 17 percent of the total farmland enrolled in 1988. Sales by non-participants in PA 116 represented 24 percent in the same year.

The reasons for enrollment were mainly property tax relief (68.8%), protection of farmland (43.3%), and love of farming (43.2%) (Frankel and Connor , 1988). Love of farming was questioned earlier by Relis (1978), who argued that today's farmer is basically a businessperson who is satisfied to abandon farmlands for a good price. He added that property tax relief measures can help the farmer to get that good price. Farmers might stay in farming until urban pressure forces the land values to a lucrative point. They then sell land (or part of it) to developers.

VI.5. Summary of the Chapter

This chapter described the patterns of enrollment and early termination of contracts. The main conclusions from the descriptive analysis of the effectiveness of PA 116 are: About 73 percent of counties in southern Michigan enrolled less than 50 percent of the land in farms during the period 1978-1987. The enthusiasm brought about by the program faded statewide after three years of its enactment. Attractive land prices, with respect to property tax credits, especially in urban areas, may have slowed down enrollment. It was found that enrollment was positively correlated with PA 116 credits. It was negatively correlated with farmland values. More urban counties did not enroll in PA 116 because of attractive farmland values. Enrollment in the program reached a saturation point around the 10 year minimum length of a contract.

Termination of contract, on the other hand, occurred in counties expecting economic growth. Low PA 116 credits and the poor quality of information about the program contributed to early termination. The closeness of farms to urban areas does not necessary lead to contract termination.

CHAPTER VII. CONCLUDING SUMMARY, POLICY IMPLICATIONS AND FUTURE RESEARCH NEEDS

This chapter presents the major conclusions of the study. Suggestions for improving the effectiveness of PA 116, and future research needs to help inform policy making are made.

VII.1. Concluding Summary

There was a shift in land use policy in the U.S. in the early 1900s. There was a passage from a laissez-faire policy to governmental intervention for a sustainable land use. Farmland was converted to non-agricultural uses as a result of property tax burden on farmers, which was due to suburbanization and improved transportation systems. The main issues raised by farmland protection programs were the intervention of the government in regulating land use, incentives and enforceability of the program, farmland value assessment, and land planning.

Two schools of thought developed. The first school adopted a conservation point of view. It was for governmental involvement in protecting farmland. The second school was oriented to free enterprise. This school argued that market forces should regulate land use. Farmland protection programs were enacted nationwide in the 1960s to

slow down farmland conversion, because there was a rapid growth in industrial and infrastructural development. Four main types of programs were enacted in different states. These were preferential assessment, deferred taxation, restrictive agreements, and circuit breaker programs. The Michigan Farmland and Open Space Preservation Act of 1974, a circuit breaker program, was not therefore an isolated case. It was following the national trend to protect farmland from conversion to non-agricultural activities. The research questions were based on the effectiveness of PA 116 in sustaining enrollment, especially in urban fringe areas.

The effectiveness of farmland protection programs nationwide was measured by the number of acres enrolled and the number of counties participating. Weak monetary incentives, with respect to farmland market prices, were found to be a major constraint on increased participation in farmland protection programs.

In this study, the rate of enrollment was added to the definition of effectiveness. It was used to analyze the behavior of landowners in the adoption of PA 116. The current enrollment (acres) was compared to the potential enrollment (total acreage in farms) to determine the rate of adoption (enrollment) in each county.

The principal findings of this study are:

VII.1. At the State Level

First, accumulated contracts and acres enrolled increased. Following an initial increase in enrollment, enthusiasm tended to fade after 1978. Farmers continued to enroll in the program but did not bring in as many acres as before. Farms were divided into small plots, which were gradually enrolled.

Second, the average acreage per contract has decreased. Hence, although the total number of acres of agricultural land enrolled has increased, many counties in Michigan still did not commit a relatively high percentage of their land to the program in 1990. Acreage enrolled represented only 44 percent of the total land in farms in 1991. Only 37 percent of farmers participated in the program up to 1991.

Third, attractive prices for individual farmland may have contributed to reduced enrollment, especially in urban fringe areas. In general, however, the average real values of land per acre decreased during the period 1978-1990, especially since 1982.

Fourth, PA 116 credits, contracts and acres enrolled dropped before the first 10 year minimum length of a contract. The year of 1982 was a saturation point for

enrollment at the state level.

VI.1.2. At the County Level

First, the Thumb area and the southern part of Michigan led in enrollment after 1976. The total acreage in farms increased from 1974 to 1982 and decreased from 1982 to 1987. The acreage enrolled increased at a growing rate from 1978 to 1982 and increased at a declining rate from 1982 to 1987.

Second, about one third of counties in southern Michigan experienced a cumulative enrollment of at least 50 percent of land in farms in 1990. The remaining two third had an enrollment of less than 50 percent. More urban counties enrolled less than 45 percent of their land in farms.

Third, PA 116 credits as a percentage of the total agricultural property taxes followed the same pattern of enrollment. Western counties, along with those located in the Thumb area and in the southern part of Michigan, received a relatively higher percentage of property tax refunds than more urban counties. However, PA 116 credits have not been competitive with land market prices in more urban counties. Low enrollment occurred in more urban counties, where farmland values are relatively high.

Fourth, the average real values of farmland per acre increased during the period 1964-1978, especially in urban counties. The real values of farmland increased in more rural counties, located especially in the Thumb area, during the period 1974-1982. Overall, these values decreased during the period 1982 - 1987.

Fifth, the Thumb area and counties at the border with the State of Ohio, which constitute the more rural counties, had the highest rates of enrollment, whereas more urban counties had the lowest rate of enrollment. The fear of building sites for waste disposal and the construction of economic infrastructures in some counties may have increased their enrollment.

Sixth, early termination of contracts took place because of attractive land market prices, insufficient incentives, financial hardship of participants, and the lack of information. In most cases of early termination, the length of the contract was less than 10 years. Most of cases of early termination occurred in counties which were expecting some development to take place by 1990. Cases of early termination occurred where potential land market prices were expected to be higher than PA 116 credits. Moreover, most cases of early termination consisted of participants whose enrollment started in the 1980s.

Overall, the enthusiasm that participants had at the beginning of the program faded after the first 10 year minimum length time of a contract. Also, the more economic growth is expected in a given county, the more likely farmers are going to terminate their contracts. Therefore, the future of enrollment in PA 116 in more urban or urbanizing counties is not guaranteed. The retention of enrollment will not take place if PA 116 credits do not increase to offset the impact of land market prices on the decision to sell agricultural land. Enrollment is positively correlated with PA 116 credits. It is negatively correlated with farmland values. Therefore, more rural counties benefitted the most from the program.

The principal conclusions of this study are: (1) PA 116 credits have to be more competitive with farmland prices to sustain enrollment, especially in urban fringe areas. They were not successfully used as a tool to reduce urban sprawl in urban counties; (2) The rigid enforcement of the program cannot stop early termination of contracts in areas of potential economic growth, unless it is coupled with adequate incentives. As long as farmers do not have enough freedom to exert their rights on the property they own, the rigid enforcement of PA 116 will continue to be a constraint on enrollment; (3) PA 116 is not effective in protecting farmland in more urban or urbanizing counties. Even in more

rural counties, where enrollment has been significant, many farmers did not commit their entire land to the program. The continuation of urban sprawl was due to insufficient incentives and the lack of special treatment of farmers in urban fringe areas.

VII.2. Policy Implications

Property tax relief was decided to be part of the solution to the problem of losing agricultural land around urban areas in the State of Michigan.

It is important for the State of Michigan to maintain its agricultural industry as one of the major contributors to the statewide economy. As such, the Michigan Farmland and Open Space Preservation Act of 1974 is justified. It is also equally important to guarantee economic growth based on non-farming activities related directly or indirectly to agriculture.

So far, very few farmers, especially in urban fringe areas, enrolled their land because land market prices are more attractive than PA 116 credits, increasing thereby opportunities to invest in non-farm activities. However, if the provisions related to the lien and the minimum length time of a contract are still a handicap, even in counties which have a relatively higher rate of enrollment, an effort

should be put in revising the provisions to make PA 116 less rigid. The provisions of PA 116 should be adjusted to economic conditions prevailing in the State because changes occurred in Michigan since 1974.

Moreover, the use-value assessment of farmland may be a misleading strategy, since farmland values keep changing as economic growth takes place even in areas originally reserved primarily for agricultural activities. Thus, strategies have to be found to increase and to retain enrollment in PA 116.

Given the low competitiveness of PA 116 with respect to market prices of farmlands, the concentration of PA 116 credits in more agricultural counties (larger farms) relative to the more urban counties (smaller farms), and the importance of both agricultural and non-agricultural activities in the State of Michigan, the following are some of the measures that can be implemented to improve the effectiveness of the program:

- Give a sustained preferential treatment to farmers in urban fringe areas, such that PA 116 credits represent a real relief of property taxes. PA 116 credits were found to be a key variable determining both enrollment and withdrawal from the program. They should therefore be more competitive than land market prices, especially in more urban counties.

Urban counties need more monetary incentives in order to increase and to retain enrollment. Land market prices continue to attract farmers, increasing therefore the opportunity cost of keeping land in farming. In other words, it costs more to farmers to stay in farming activities than converting it into non-farm uses. The incentives offered to farmers should be at least equal to the opportunity cost of keeping land in farming.

Currently, rural counties, which would continue farming without much property tax relief, are treated as urban counties, where property taxes constitute a constraint to the profitability of farms. As the program was designed to reduce farmland conversion to non-farming uses, especially in urban fringe areas, more resources should be concentrated in those areas;

- Reduce the minimum period farmers have to stay in the program, since most cases of termination of contracts occurred before 10 years. Farmers have to feel free to enroll in PA 116 and to exit after a relatively short period if they think they cannot stay in it longer.

Flexibility in the enforcement of PA 116 is therefore required in revamping the program. One of the reasons to enroll was the desire to protect family farms as a way of living. As such, farmers intend to keep their property

rights on land. Relaxation of the control over PA 116 would thereby preserve farmers' property rights. A relatively loose control over the program coupled with an increase in PA 116 credits may increase enrollment in urban fringe areas.

If farmers want to get out of the program, it may mean that keeping land in farming activities is no longer a priority to them. Forcing them to remain in the program would not be a solution, because investment in non-farm activities would be perceived as more profitable than in agriculture.

At the same, time, farmers who decide to remain in the program should be encouraged. The amount of the lien should decrease as farmers decide to remain longer in the program after the period of trial. In other words, the more farmers stay in PA 116, the less penalty applies to them;

VII.3. Future Research Needs

The performance of a program like PA 116 requires an understanding of its contribution to the society as a whole. Farmers are the primary target. However, as long as land is a multi-purpose factor of production, it is a concern of the entire community. Therefore, PA 116 should be designed to accommodate conflicting uses. The following are some of the

further investigations the study of the effectiveness of PA 116 needs to be more complete:

- It is necessary to analyze the cost of the program to the State of Michigan to run the program under both the current and the proposed policies. Although landowners enrolled in PA 116 pay taxes at the local level, like any other citizen, the tax credits they receive as an incentive constitute a type of subsidy. The subsidy to farmers, or the negative revenue to the State of Michigan, reduces therefore the statewide treasury, forcing the State to cut funds on some programs to compensate the negative revenue.

In addition, a benefit/cost analysis of making PA 116 competitive with opportunities offered by the market prices of land, especially in urban fringe areas, would indicate the opportunity cost of keeping land in farming. Since early termination of contracts was found to be more positively correlated with expected economic growth than the distance from the city, it would be useful to identify zones of potential increase in economic growth prior to deciding to increase PA 116 credits in these zones.

Increasing incentives in the targeted area results in increased costs to run the program. It can equally lead to increased state revenues, via indirect taxes that come from increased agricultural production. Consequently, the

effectiveness of the program on the state side gives a broader view of the performance of the Michigan farmland protection program;

- On the other hand, it is important to assess the willingness of farmers to remain in farming, given the attractiveness of land market prices and options they have to invest the money they would get from selling off the land. Farming in areas with fewer alternatives does not constitute a threat to land conversion in the short run. The probability that farmers will not quit farming is high. Farmers located in more urban or urbanizing areas, however, have many options and are more likely to invest in non-farming activities. Therefore, it is essential for the State of Michigan to know preferences of farmers before any amendment of PA 116 can be done.

POSTSCRIPT

The essence of protecting agricultural land in the State of Michigan is applicable in Burundi. The main goal of PA 116 is to reduce urban sprawl in agricultural areas, and subsequently, to increase or maintain agricultural production. Property tax relief is used as a policy instrument that the State of Michigan has adopted to reach the goal.

Likewise, there is a conflict in allocating land between food crops and cash crops on individual farms in Burundi. Farmers have to use the already small plots for the subsistence of the family and for income generation. The pressure on land, resulting from land resource scarcity, leads to farmland overuse, which, in turn, brings about land degradation. Hence, environmental problems constitute one of the major issues in Burundi. The question is the following: what types of incentives can be offered to farmers to protect farmland from degrading?

At the country level, Burundi faces a problem of allocating land between agricultural production and non-farm activities. On the one hand, Burundi has to rely on agricultural production to develop its infant industry, whose main inputs come from agriculture. On the other hand, the population of Burundi is growing rapidly. Therefore,

feeding the increasing population and improving its standard of living are other major issues in Burundi. The question is the following: how much land is needed in Burundi for self-sufficiency in food production as well as for other essential activities for the economic growth of the country? As such, farmland protection programs are justified in Burundi. Thus, in the absence of technological improvements, farmland conversion to non-agricultural activities would jeopardize food production in Burundi.

On the other hand, while people move from urban to rural areas to avoid prohibitive property taxes in the State of Michigan, people in Burundi, especially unskilled labor, move from rural to urban areas to seek wage employment. This rural out migration brings about the growth of urban slums, which often infringe on good agricultural land around cities. The types of incentives to give to landowners in urban areas to prevent urban sprawl in Burundi constitute another issue.

Research in land planning is therefore needed in Burundi to prevent the disorderly growth of slums, and thus, uncontrolled urban sprawl. As such, this study is a useful tool to identify some of the difficulties various states which enacted farmland protection programs, like the State of Michigan, experienced in designing and implementing those programs in order to improve land use policy in Burundi.

APPENDICES

1. The Michigan Farmland and Open Space Preservation Act;
2. Representatives Who Introduced PA 116;
3. Farmland Agreements per County;
4. Cases of Termination of Contracts;
5. Length of Contracts;
6. Nominal Values of Farmlands per Acre ($), Michigan, 1977-1990;
7. Nominal Values of Farmland per Acre ($), per County, Southern Michigan, 1974-1987;
8. Consumer Price Index;
9. Data on Enrollment in PA 116, 1982;
10. Data on Enrollment in PA 116, 1987.

Appendix 1. The Michigan Farmland and Open Space Preservation Act

Act No. 116
Public Acts of 1974
Approved by Governor
May 23, 1974

STATE OF MICHIGAN
77TH LEGISLATURE
REGULAR SESSION OF 1974

ENROLLED HOUSE BILL No. 4244

AN ACT to provide for farmland development rights agreements and open space development rights easements; to prescribe the duties of the state land use agency; to prescribe the duties of local governing bodies; to prescribe the powers and duties of certain state departments; and to prescribe penalties.

The People of the State of Michigan enact:

Sec. 1. This act shall be known and may be cited as the "farmland and open space preservation act".

Sec. 2. (1) "Agricultural use" means substantially undeveloped land devoted to the production of plants and animals useful to man, including forages and sod crops; grains and feed crops; dairy and dairy products; livestock, including breeding and grazing; fruits; vegetables; and other similar uses and activities.

(2) "Development" means an activity which materially alters or affects the existing conditions or use of any land.

(3) "Development rights" means the right to construct a building or structure, to improve land, or the extraction of minerals incidental to a permitted use or as shall be set forth in an instrument recorded pursuant to this act.

(4) "Development rights agreement" means a restrictive covenant, evidenced by an instrument whereby the owner and the state, for a term of years, agree to jointly hold the right to develop the land as may be expressly reserved in the instrument, and which contains a covenant running with the land, for a term of years, not to develop, except as this right is expressly reserved in the instrument.

(5) "Development rights easement" means a grant, by an instrument, whereby the owner relinquishes to the public in perpetuity or for a term of years, the right to develop the land as may be expressly reserved in the instrument, and which contains a covenant running with the land, not to develop, except as this right is expressly reserved in the instrument.

(6) "Farmland" means:

(a) A farm of 40 or more acres, in one ownership which has been devoted primarily to an agricultural use.

(b) A farm of 5 acres or more in one ownership, but less than 40 acres, devoted primarily to an agricultural use, which has produced a gross annual income from agriculture of $200.00 per year or more per acre of cleared and tillable land.

(c) A farm designated by the department of agriculture as a specialty farm in one ownership which has produced a gross annual income from an agricultural use of $2,000.00 or more.

(d) Parcels of land in one ownership which are not contiguous but which constitute an integral part of farming operation being conducted on land otherwise qualifying as farmland may be included in an application under this act.

(7) "Local governing body" means:

(a) The legislative body of a city or village.

(b) The township board of a township having a zoning ordinance in effect as provided by law.

(c) The county board of commissioners in all other areas.

(8) "Open space land" means:

(a) Lands defined as:

(i) Any undeveloped site included in a national registry of historic places or designated as an historic site pursuant to state or federal law.

(ii) Riverfront ownership subject to designation under Act No. 231 of the Public Acts of 1970, being sections 281.761 to 281.776 of the Michigan Compiled Laws, to the extent that full legal descriptions may be declared open space under the meaning of this act, if the undeveloped parcel or government lot parcel or portions thereof as assessed and owned is affected by such act and lies within 1/4 mile of the river.

(iii) Undeveloped lands designated as environmental areas under Act No. 245 of the Public Acts of 1970, being sections 281.631 to 281.645 of the Michigan Compiled Laws, including unregulated portions thereof.

(b) Any other area approved by the local governing body, the preservation of which in its present condition would conserve natural or scenic resources, including: the promotion of the conservation of soils, wetlands, and beaches; the enhancement of recreation opportunities; the preservation of historic sites; and idle potential farmland of not less than 40 acres which is substantially undeveloped and which because of its soil, terrain, and location is capable of being devoted to agricultural uses as identified by the department of agriculture.

(9) "Owner" means a person having a freehold estate in land coupled with possession and enjoyment. However, where land is subject to a land contract, it means the vendor in agreement with the vendee.

(10) "Permitted use" means any use contained within a development rights agreement or a development rights easement essential to the farming operation or which does not alter the open space character of the land.

(11) "Person" includes an individual, corporation, business trust, estate, trust, partnership, or association, or 2 or more persons having a joint or common interest in the land.

(12) "Property taxes" means general ad valorem taxes levied after January 1, 1974, on lands and structures in this state, including collection fees, but not including special assessments, penalties, or interest.

(13) "Regional planning commission" means a regional planning commission created pursuant to Act No. 281 of the Public Acts of 1945, as amended, being sections 125.11 to 125.25 of the Michigan Compiled Laws.

(14) "Regional planning district" means the planning and development regions as established by executive directive 1968-1, as amended, whose organizational structure is approved by the regional council.

(15) "Soil conservation district" means a district created pursuant to Act No. 297 of the Public Acts of 1937, as amended, being sections 282.1 to 282.16 of the Michigan Compiled Laws.

(16) "State income tax act" means Act No. 281 of the Public Acts of 1967, as amended, being sections 206.1 to 206.532 of the Michigan Compiled Laws, and in effect during the particular year of the reference to the act.

(17) "State land use agency" means the land use agency within the department of natural resources.

(18) "Substantially undeveloped" means any parcel or area of land essentially unimproved except for a dwelling, building, structure, road, and other improvement that is incidental to agricultural and open space uses.

(19) "Unique or critical land area" means agricultural or open space lands identified by the land use agency as an area which should be preserved in its natural condition.

Sec. 3. (1) The state land use agency may execute a development rights agreement or easement on behalf of the state.

(2) The provisions of a development rights agreement or easement shall be consistent with the purposes of this act and shall not permit an action which will materially impair the character of the land involved.

Sec. 4. (1) The execution and acceptance of a development rights agreement or easement by the state or local governing body and the owner shall constitute a dedication to the public of the development rights in the land for the term specified in the instrument. A development rights agreement or easement shall be for a term of not less than 10 years.

(2) The state or local governing body shall not sell, transfer, convey, relinquish, vacate, or otherwise dispose of a development rights agreement or easement except with the mutual agreement of the owner as provided in sections 12, 13, and 14.

(3) An agreement or easement shall not supersede any prior lien, lease, or interest which is properly recorded with the county register of deeds.

Sec. 5. (1) An owner of land desiring a farmland development rights agreement may apply by filing an application with the local governing body having jurisdiction under this act. The application shall be made on a form prescribed by the state land use agency. The application shall contain information reasonably necessary to properly classify the land as farmland. This information shall include a land survey or a legal description of the land, and a map showing the significant natural features and all structures and physical improvements located on the land. The application shall include the soil classification of the land if known.

(2) Upon receipt of the application, the local governing body shall notify the county planning commission or the regional planning commission and the soil conservation district agency. If the county has jurisdiction, it shall also notify the township board of the township in which the land is situated. If the land is within 3 miles of the boundary of a city or within 1 mile of the boundary of a village, the county or township governing body having jurisdiction shall notify the governing body of the city or village.

(3) An agency or local governing body receiving notice shall have 30 days to review, comment, and make recommendations to the local governing body with whom the application is filed.

(4) After considering the comments and recommendations of the reviewing agencies and local governing bodies, the local governing body holding the application shall approve or reject the application within 45 days after the application is received unless time is extended by mutual agreement of the parties involved. The local governing body's approval or rejection of the application shall be based upon, and consistent with, rules promulgated by the state land use agency pursuant to section 11.

(5) If an application for a farmland development rights agreement is approved by the local governing body having jurisdiction, a copy, along with the comments and recommendations of the reviewing bodies, shall be forwarded to the state land use agency. If no action is taken by the local governing body within the time prescribed or agreed upon, the applicant may proceed as provided in subsection (6) as if the application was rejected.

(6) If the application for a farmland development rights agreement is rejected by the local governing body, it shall return the application to the applicant with a written statement regarding the reasons for rejection. Within 30 days after receipt of the rejected application, the applicant may appeal the rejection to the state land use agency. The state land use agency shall have 60 days to approve or reject the application pursuant to subsection (7).

(7) The state land use agency, within 60 days after the farmland development rights agreement application has been received, shall approve or reject the application. A rejection of an application for a farmland development rights easement which has been approved by a local governing body by the state land use agency shall be for nonconformance with section 2 (6) only. If approved by the state land use agency, it shall prepare a farmland development rights agreement which shall include the following provisions:

(a) A structure shall not be built on the land except for use consistent with farm operations or with the approval of the local governing body and the state land use agency.

(b) Land improvements shall not be made except for use consistent with farm operations or with the approval of the local governing body and the state land use agency.

(c) Any interest in the land shall not be sold except a scenic, access, or utility easement which does not substantially hinder farm operations.

(d) Public access shall not be permitted on the land unless agreed to by the owner.

(e) Any other condition and restriction on the land as agreed to by the parties that is deemed necessary to preserve the land or appropriate portions of it as farmland.

Upon receipt of the application, the state land use agency shall notify the state tax commission. Upon notification, the state tax commission shall within 60 days make an on-site appraisal of the land and structures in compliance with the agricultural section of the Michigan state tax commission assessors manual. The approved application shall contain a statement specifying the current fair market value of the land as determined by the state tax commission. A copy of the approved application and the farmland development rights agreement shall be forwarded to the applicant for execution.

(8) If the owner executes the farmland development rights agreement, he shall return it to the state land use agency for execution on behalf of the state. The state land use agency shall record the executed development rights agreement with the register of deeds of the county in which the land is situated and shall notify the applicant, the local governing body and its assessing office, all reviewing agencies, and the department of treasury.

(9) If an application for a farmland development rights agreement is rejected by the state land use agency, it shall notify the affected local governing body, all reviewing agencies concerned, and the applicant with a written statement containing the reasons for rejection. An applicant receiving a rejection from the state land use agency may appeal the rejection pursuant to Act No. 306 of the Public Acts of 1969, as amended, being sections 24.201 to 24.315 of the Michigan Compiled Laws.

(10) An applicant may reapply for a farmland development rights agreement following a 1-year waiting period.

(11) The value of the jointly owned development rights as expressed in a farmland development rights agreement shall not be exempt from ad valorem taxation and shall be assessed to the owner of the land as part of the value of that land.

Sec. 6. (1) If an owner of open space land desires an open space development rights easement, and the land is subject to the provisions of section 2 (8) (a), the procedures for filing an application provided by the state land use agency shall follow as provided in section 5, except subsections (7) and (11).

(2) The state land use agency, within 60 days after the open space development rights easement application has been received, shall approve or reject the application. If approved by the state land use agency, it shall prepare an open space development rights easement which shall include the following provisions:

(a) A structure shall not be built on the land without the approval of the state land use agency.

(b) Improvement to the land shall not be made without the approval of the state land use agency.

(c) Any interest in the land shall be sold only for a scenic, access, or utility easement which does not substantially hinder the character of the open space land.

(d) Access to the open space land may be provided if agreed upon by the owner and will not jeopardize the conditions of the land.

(e) Any other condition or restriction on the land as agreed to by the parties that is deemed necessary to preserve the land or appropriate portions of it as open space land. Upon receipt of the application, the state land use agency shall notify the state tax commission. Upon notification, the state tax commission shall within 60 days make an on-site appraisal of the land in compliance with the Michigan state tax commission assessors manual. The application shall contain a statement specifying the current fair market value of the land and the current fair market value of the development rights. The state land use agency shall submit each application for an open space development rights easement and an analysis of its cost to the state to the legislature. The application shall be approved in both houses by a resolution concurred in by a majority of the members elected and serving in each house. The amount of the cost shall be returned to the local governing body where lost revenues are indicated. A copy of the approved application and the open space development rights easement shall be forwarded by the state land use agency to the applicant for execution and to the local assessing office where the land is situated.

(3) The development rights held by the state as expressed in an open space development rights easement under this section shall be exempt from ad valorem taxation.

Sec. 7. (1) An owner of open space land desiring an open space development rights easement whose land is subject to the provisions of section 2 (8) (b), may apply by filing an application with the local governing body having jurisdiction under this act. The application shall be made on a form prescribed by the state land use agency. The application shall contain information reasonably necessary to properly identify the land as open space. This information shall include a land survey or a legal description of the

land, and a map showing the significant natural features and all structures and physical improvements located on the land. The map shall include the soil classification of the land if known.

(2) Upon receipt of an application, the local governing body shall notify the county planning commission, the regional planning commission, and the soil conservation district agency. If the county has jurisdiction, it shall also notify the township board of the township in which the land is situated. If the land is within 3 miles of the boundary of a city or within 1 mile of the boundary of a village, the county shall notify the governing body of the city or village.

(3) An agency or local governing body receiving notice shall have 30 days to review, comment, and make recommendations to the local governing body with whom the application was filed.

(4) After considering the comments and recommendations of the reviewing agencies, the local governing body shall approve or reject the application within 45 days after the application has been received by it unless time is extended by mutual agreement of the parties involved. The local governing body's approval or rejection of the application shall be based upon, and consistent with, rules promulgated by the state land use agency pursuant to section 17. If the local governing body does not act within the time prescribed or agreed upon, the applicant may proceed as provided in subsection (8) as if the application was rejected.

(5) If the application is approved by the local governing body or the state land use agency on appeal, the local governing body shall prepare an appropriate easement which shall include the following provisions:

(a) A structure shall not be built on the land without the approval of the local governing body.

(b) An improvement to the land shall not be made without the approval of the local governing body.

(c) Any interest in the land shall not be sold except for scenic, access, or utility easements which do not substantially hinder the character of the open space land.

(d) Public access to the open space land may be provided if agreed upon by the owner and will not jeopardize the conditions of the land.

(e) Any other condition or restriction on the land as agreed to by both parties that is deemed necessary to preserve the land or appropriate portions of it as open space land.

Upon receipt of the application, the local governing body shall direct either the local assessing officer or an independent certified assessor to make an on-site appraisal within 30 days of the land in compliance with the Michigan state tax commission assessors manual. The approved application shall contain a statement specifying the current fair market value of the land and the current fair market value of the development rights, if any. A copy of the approved application and the development rights easement shall be forwarded to the applicant for his execution.

(6) If the owner of the land executes the approved easement, it shall be returned to the local governing body for its execution. The local governing body shall record the open space development rights easement with the register of deeds of the county. A copy of the approved easement shall be forwarded to the local assessing office and to the state land use agency for their information. The state land use agency shall submit to the legislature and the department of management and budget a listing of all easements in effect by October 31 of each year.

(7) The decision of the local governing body having jurisdiction under this act may be appealed to the state land use agency, pursuant to subsection (8).

(8) If an application for an open space development rights easement is rejected by the local governing body, it shall notify the applicant and all reviewing agencies concerned with a written statement regarding the reasons for rejection. Within 30 days after receipt of the rejected application, the applicant may appeal the rejection to the state land use agency. The state land use agency shall have 60 days to approve or reject the application. The state land use agency shall submit each approved application for an open space development rights easement and an analysis of its cost to the legislature. The application shall be approved in both houses by a resolution concurred in by a majority of the members elected and serving in each house. The amount of the cost shall be returned to the local governing body where lost revenues are indicated. A copy of the approved application and an appropriate easement shall be forwarded by the state land use agency to the applicant for execution and to the local governing body where the land is situated.

(9) An applicant may reapply for an open space development rights easement following a 1-year waiting period.

(10) The development rights held by the local governing body as expressed in an open space development rights easement shall be exempt from ad valorem taxation.

Sec. 8. All participants owning land contained under a development rights agreement or easement shall notify, on a form provided by the state land use agency for informational purposes only, the state or the local governing body holding the development rights 2 years prior to the natural termination date of the development rights agreement or easement of the owners' intentions regarding future plans with respect to the land.

Sec. 9. A city, village, township, county, or other governmental agency may not impose special assessments for sanitary sewers, water, lights, or nonfarm drainage on land for which a development rights agreement or easement has been recorded except as to a dwelling or a nonfarm structure located on the land unless the assessments were imposed prior to the recording of the development rights agreement or easement. Land covered by this exemption shall be denied use of an improvement created by the special assessment until it has paid an amount not more than the amount that would have been paid had the land not been excluded. The land exempted from the assessment shall be denied use of the improvement as long as the owner of the land has a recorded development rights agreement or easement.

Sec. 10. (1) (a) The owner of farmland and related buildings covered by a development rights agreement meeting the requirements of this act and who is required or eligible to file a return as an individual or a claimant under the income tax act of 1967, shall be eligible for a credit against the state income tax liability for the amount by which the property taxes on the land and structures used in the farming operation, including the homestead, restricted by such development rights agreement exceeds 7% of the household income as defined in chapter 9 of Act No. 281 of the Public Acts of 1967, as amended, being sections 206.501 to 206.532 of the Michigan Compiled Laws, excluding any deduction if taken under section 613 of the internal revenue code of 1954, as amended.

(b) Other owners of farmland and related buildings covered by a development rights agreement meeting the requirements of this act shall be eligible for a credit against the state income tax liability for the amount by which the property taxes on the land and structures used in farming operations restricted by such development rights agreement exceeds 7% of the taxable income of the owner as defined in chapter 1 of Act No. 281 of the Public Acts of 1967, as amended, being sections 206.1 to 206.36 of the Michigan Compiled Laws, excluding any deductions if taken under section 613 of the internal revenue code of 1954, as amended.

(c) The beneficiaries of an estate or trust, a partner in a partnership, or a participant in a corporation which has filed a proper election under subchapter S of the internal revenue code is entitled to the same percentage of the credit provided in this section as that person's percentage of all other distributions by the entity.

(2) A person applying for an income tax credit for property taxes paid under subsection (1) may apply for credit under chapter 9 of Act No. 281 of the Public Acts of 1967, being sections 206.501 to 206.532 of the Michigan Compiled Laws.

(3) If the allowable amount of the credit claimed exceeds the state income tax otherwise due for the tax year or if there is no state income tax due for the tax year, the amount of the claim not used as an offset against the state income tax shall, after examination and review, be approved for payment, without interest, to the claimant.

(4) For purposes of audit, review, determination, appeals, hearings, notices, assessments, and administration, the provisions of Act No. 281 of the Public Acts of 1967, as amended, shall apply.

(5) The department of treasury shall account separately for payments under this act and not combine them with other credit programs.

Sec. 11. (1) Land subject to a development rights agreement or easement may be sold without penalty under sections 12, 13, and 14, if the use of the land by the successor in title complies with the provisions contained in the development rights agreement or easement. The seller shall notify the governmental authority having jurisdiction over the development rights of the change in ownership.

(2) When the owner of land subject to a development rights agreement or easement dies or is totally and permanently disabled, the land may be released from the program under this act and shall be subject to a proration pursuant to sections 12(7), 13(7) and 14(7).

Sec. 12. (1) A development rights agreement shall be relinquished by the state at the expiration of the term of the agreement unless renewed with the consent of the owner of the land.

(2) A development rights agreement may be relinquished by the state prior to a termination date contained in the instrument as follows:

(a) At any time the state determines that the development of the land is in the public interest and in agreement with the owner of the land.

(b) The owner of the land may submit an application to the local governing body having jurisdiction under this act requesting that the development rights agreement be relinquished. The application shall be made on a form prescribed by the state land use agency. The request for relinquishment shall be processed and shall be subject to the same provisions as provided for in section 5 for review and approval.

(3) If the request for relinquishment of the development rights agreement is approved, the state land use agency shall prepare an instrument, subject to subsections (4), (5), (6), and (7), and shall record it with the register of deeds of the county in which the land is situated.

(4) At the time a development rights agreement is to be relinquished pursuant to subsection (2) (b), the state land use agency shall cause to be prepared and recorded a lien against the property formerly subject to the development rights agreement for the total amount of the credit in the state income tax received by the owner under section 10. The lien shall provide that interest at the rate of 6% per annum compounded shall be added to the credit from the time the credit was received until it is paid.

(5) The lien may be paid and discharged at any time and shall become payable to the state by the owner of record at the time the land or any portion of it is sold by the owner of record, or if the land is converted to a use prohibited by the former development rights agreement. The lien shall be discharged upon renewal or reentry in a development rights agreement, except that a subsequent lien shall not be less than the lien discharged. The proceeds from the payment shall be used to purchase development rights on land which is deemed by the state land use agency to be a unique or critical land area that should be preserved in its natural character, but which does not necessitate direct purchase of the fee interest in the land.

(6) Upon termination of the development rights agreement pursuant to subsection (2) (a), the development rights shall revert back to the owner without penalty or interest.

(7) Upon the natural termination of the development rights agreement pursuant to subsection (1), the state land use agency shall cause to be prepared and recorded a lien against the property formerly subject to the development rights agreement for the total amount of the credit in the state income tax of the last 7 years received by the owner under section 10. The lien shall be without interest or penalty and shall be payable subject to subsection (5).

(8) Upon termination, the state land use agency shall notify the department of treasury for their records.

Sec. 13. (1) An open space development rights easement pursuant to section 6 shall be relinquished by the state at the expiration of the term of the easement unless renewed with the consent of the owner of the land.

(2) An open space development rights easement may be relinquished by the state prior to a termination date contained in the instrument as follows:

(a) At any time the state determines that the development of the land is in the public interest and in agreement with the owner of the land.

(b) The owner of the land may submit an application to the local governing body where the original application for an open space development rights easement requesting that the development rights easement be relinquished. The application shall be made on a form prescribed by the state land use agency. The request for relinquishment shall be processed and shall be subject to the provisions as provided in sections 5 and 6 for review and approval.

(3) If the request for relinquishment of the development rights easement is approved, the state land use agency shall prepare an instrument providing for the relinquishment of the open space development rights easement, subject to subsections (4), (5), (6), and (7), and shall record it with the register of deeds of the county in which the land is situated.

(4) At the time a development rights easement is to be relinquished pursuant to subsection (2) (b), the state land use agency shall cause to be prepared and recorded a lien against the property formerly subject to the development rights easement for the total amount of the ad valorem taxes not paid on the development rights during the period it was held by the state, if any. The lien shall provide that interest at the rate of 6% per annum compounded shall be added to the ad valorem taxes not paid from the time the exemption was received until it is paid.

(5) The lien shall become payable to the state by the owner of record at the time the land or any portion of it is sold by the owner of record, or if the land is converted to a use prohibited by the former open space development rights easement.

(6) Upon the termination of the open space development rights easement pursuant to subsection (2) (a), the development rights shall revert back to the owner without penalty or interest.

(7) Upon the natural termination of the open space development rights easement pursuant to subsection (1), the state land use agency shall cause to be prepared and recorded a lien against the property formerly subject to the open space development rights easement. The amount of the lien shall be the total amount of the last 7 years ad valorem taxes not paid on the development rights during the period it was held by the state, if any. The lien shall be without penalty or interest and shall be payable subject to subsection (5).

(5) A copy of the relinquishment of an open space development rights easement shall be sent to the local governing body's assessing office.

Sec. 14. (1) An open space development rights easement pursuant to section 7 shall be relinquished by the local governing body at the expiration of the term of the easement unless renewed with the consent of the owner of the land.

(2) An open space development rights easement may be relinquished by the local governing body prior to a termination date contained in the instrument as follows:

(a) At any time the local governing body determines that the development of the land is in the public interest and in agreement with the owner of the land.

(b) The owner of the land may submit an application to the local governing body having jurisdiction requesting that the development rights easement be relinquished. The application shall be made on a form prescribed by the state land use agency. The request for relinquishment shall be processed and shall be subject to the provisions as provided in section 7 for review and approval.

(3) If the request for relinquishment of the open space development rights easement is approved, the local governing body shall prepare an instrument providing for the relinquishment of the open space development rights easement, subject to subsections (4), (5), (6), and (7), and shall record it with the register of deeds of the county in which the land is situated.

(4) At the time an open space development rights easement is to be relinquished pursuant to subsection (2) (b), the local governing body shall cause to have prepared and recorded a lien against the property formerly subject to the open space development rights easement. The amount of the lien shall be the total amount of the ad valorem taxes not paid on the development rights during the period it was held by the local governing body, if any. The lien shall provide that interest at the rate of 6% per annum compounded shall be added to the ad valorem taxes exemption from the time granted until the lien is paid.

(5) The lien shall become payable to the local governing body by the owner of record at the time the land or any portion of it is sold by the owner of record, or if the land is converted to a use prohibited by the former open space development rights easement.

(6) Upon the termination of the open space development rights easement pursuant to subsection (2) (a), the development rights shall revert back to the owner without penalty or interest and the development rights easement upon the land shall expire.

(7) Upon the natural termination of the open space development rights easement pursuant to subsection (1), the local governing body shall cause to be prepared and recorded a lien against the property formerly subject to the open space development rights easement. The amount of the lien shall be the total amount of the last 7 years ad valorem taxes not paid on the development rights during the period it was held by the local governing body, if any. The lien shall be without penalty or interest and will be payable subject to subsection (5).

(8) A copy of the relinquishment of an open space development rights easement shall be sent to the local assessing office.

Sec. 15. If the owner or a successor in title of the land upon which a development rights agreement or easement has been recorded pursuant to this act shall change to a prohibited use the use of the land or knowingly sell the land for a use other than those permitted in the development rights agreement or easement without first pursuing the provisions in sections 11 (2), 12, 13, and 14, or receiving permission of the state land use agency, he may be enjoined by the state, acting through the attorney general, or by the local governing body, acting through its attorney, and is subject to a civil penalty for actual damages, but in no case to exceed double the value of the land as established at the time the application for the development rights agreement or easement was approved.

Sec. 16. All departments and agencies of state government shall cooperate with the state land use agency in the exchange of information concerning projects and activities which might jeopardize the preservation of land contemplated by this act. The state land use agency shall periodically advise the departments and agencies of state government of the location and description of land upon which there exists development rights agreements or easements and the departments and agencies shall harmonize their planning and projects consistent with the purposes of this act.

Sec. 17. The state land use agency may promulgate rules pursuant to Act No. 306 of the Public Acts of 1969, as amended, for the administration of this act.

Sec. 18. The state land use agency shall prepare a report and make recommendations to the legislature not later than January 30, 1976, for a state plan for preserving open space lands, agricultural and horticultural lands, unique or critical land areas, recreational lands and historic lands.

Sec. 19. This act shall become effective July 1, 1974. ..

This act is ordered to take immediate effect.

Thos Thatcher
Clerk of the House of Representatives.

Beryl J. Kenyon
Secretary of the Senate.

Approved _____

_____
Governor.

APPENDIX 2

Representatives Who Introduced PA 116

NAMES				
Warner	Traxler	Sackett	Mastin	Powell
Fitzgerald	Geerlings	Montgomery	Van Singel	Kirby Holmes
Strang	Mowat	Bryant	Damman	Armbruster
Kennedy	Smith	Cramton	Gast	Trezise
Defebaugh	Angel	Larsen	Richard D. Buth	Prescott
Elliot	Ferguson	Novak	Forbes	Brennan
Ziegler	Dively	Loren D. Anderson	Cawthorne	DeStigter
Sharpe	Spenser	Hoffman	Ostling	Engler
Martin D. Buth	Brown	Bullard	Stallworth	Ogonowski
Nelson	Gingrass	Thomas J. Anderson	O'Neill	Raymond Wood
Smit	Hunsinger	Vaughn		
CO-SPONSORS				
Farnsworth	Robert D. Young	Varnum	Guastello	Mahalak
Jacobetti	Hellman	Welborn		

Source: Journal of the House of Representatives of the State of Michigan, 1973.

APPENDIX 3

Farmland Agreements per County per Year, Southern Michigan, 1975 - 1991

County Year	Allegan	Barry	Bay	Berrien	Branch	Calhoun	Cass
1975	0	2465	0	0	0	786	1934
1976	281	4146	1097	304	1211	1446	1323
1977	2674	2232	3987	1183	8534	7149	6166
1978	2703	5543	3219	1749	8014	13253	7682
1979	8353	5929	8494	613	17249	9305	6999
1980	18385	4156	22823	8163	33810	14805	18113
1981	14065	4484	13597	6325	9438	11663	6344
1982	17981	9183	17983	8476	19081	19011	12559
1983	12622	4332	17490	7782	17024	24722	12098
1984	10354	6890	10224	5554	8698	11435	9848
1985	10150	3222	6453	7063	9981	6545	10163
1986	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1987	1159	414	1752	582	954	977	764
1988	1183	424	1785	603	978	1003	786
1989	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1990	1187	439	1821	626	1019	1021	810
1991	1189	442	1830	630	1033	1024	813

	Clinton	Eaton	Genesee	Gratiot	Hillsd.	Huron	Ingham
1975	8212	3010	1735	1162	0	280	9626
1976	6851	1270	2165	1991	504	1673	5167
1977	17983	6357	2341	25821	6377	59862	16410
1978	8116	5017	329	26986	13569	30174	10233
1979	12539	3637	2853	43421	12924	80433	5102
1980	20622	8901	6246	32866	22625	34450	10783
1981	14345	5597	6367	23062	12168	17586	8689
1982	20305	15986	7670	21281	16568	30809	15371
1983	14386	11420	6463	18413	19507	25535	86366
1984	7629	4945	2878	10684	9558	20442	4913
1985	6758	5027	3860	7452	7127	11618	5210
1986	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1987	1292	866	469	2794	1179	3766	858
1988	1324	898	482	2837	1197	3849	871
1989	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1990	1416	959	508	2857	1261	3903	922
1991	1417	961	501	2859	1270	3914	925

APPENDIX 3 (continued)

Farmland Agreements per Year, Southern Michigan, 1975 - 1991

County Year	Ionia	Isabella	Jackson	Kalam.	Kent	Lapeer	Lenawee
1975	1416	0	4445	324	1257	514	8267
1976	1865	847	1780	1606	1419	331	1165
1977	5041	3551	4420	150	4033	1745	8251
1978	2918	2126	3100	1609	8168	5134	51216
1979	13787	8459	14981	4722	4830	0	4206
1980	15157	9445	6880	10561	6168	7003	32888
1981	9573	7355	9448	9411	8918	6572	21261
1982	17389	9434	13115	12174	8684	14338	21060
1983	17650	9160	8663	13907	14015	10343	18448
1984	10060	14749	7525	4641	5382	7145	11282
1985	7592	13466	5086	2853	4044	7666	14008
1986	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1987	1036	962	596	620	666	736	2428
1988	1056	1010	625	638	676	769	2487
1989	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1990	1080	1051	639	658	686	799	2597
1991	1082	1054	628	658	686	799	2602

	Living.	Macomb	Mecosta	Midland	Monroe	Montc.	Muskeg.
1975	380	155	270	985	590	0	797
1976	667	0	1148	1129	803	0	860
1977	949	60	1962	6248	1525	569	1239
1978	415	0	2234	3961	1507	4630	4122
1979	444	0	2297	4759	16285	4985	2887
1980	4308	270	2195	4866	22794	14843	4186
1981	4196	781	1223	3735	10305	8129	5221
1982	6334	2909	3315	8501	13658	17089	3665
1983	5192	1126	4914	8607	8283	13877	1904
1984	4397	1946	6204	5063	4747	8817	2302
1985	1945	582	3917	2242	4489	11481	1964
1986	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1987	340	89	232	650	1155	914	319
1988	345	92	260	668	1191	967	343
1989	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1990	350	94	293	676	1236	1023	358
1991	352	92	297	680	1239	1026	359

APPENDIX 3 (continued)

Farmland Agreement per Year, Southern Michigan, 1975 - 1991

County Year	Newaygo	Oakland	Oceana	Ottawa	Saginaw	Sanilac	Shiawassee
1975	0	1171	547	782	4645	0	1421
1976	40	299	2299	3185	4993	1178	2722
1977	40	1224	0	3652	33526	10268	3666
1978	1442	200	2920	6142	12574	21041	5023
1979	2716	692	916	11563	23730	35756	8844
1980	6543	191	5639	16168	16853	28220	14165
1981	7332	794	8158	9992	17456	26320	21433
1982	9725	964	5208	12797	34279	43184	19213
1983	7681	1099	11196	6635	25315	41459	13531
1984	4489	371	6276	5216	12410	20102	6587
1985	2045	1372	7338	4348	10847	19399	6139
1986	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1987	406	76	648	953	2642	2704	1033
1988	417	78	676	966	2699	2785	1086
1989	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1990	445	83	705	974	2800	2829	1141
1991	448	84	712	974	2800	2839	1145

	St Clair	St Joseph	Tuscola	Van Buren	Washtenaw	Wayne
1975	112	0	494	0	3678	304
1976	141	154	4918	576	1469	0
1977	319	0	58181	6243	1402	0
1978	1334	9112	15851	4239	4161	215
1979	1933	13072	39116	3585	10304	107
1980	2670	25000	22560	10140	11274	63
1981	3000	12751	13776	10121	11746	266
1982	6888	23440	18437	16173	12562	310
1983	3808	9119	14925	12000	9910	684
1984	6175	10159	11688	8114	7095	454
1985	2979	7341	15514	4222	2942	69
1986	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1987	306	975	2812	804	649	34
1988	314	1009	2873	819	664	34
1989	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1990	325	1042	2914	834	707	31
1991	327	1042	2923	842	710	31

Source: Michigan Department of Natural Resources, Farmland and Open Space Unit, 1992.

APPENDIX 4
Cases of Termination of the Contract in PA 116,
Southern Michigan, 1991

County	Cases	Leading Townships
Ottawa	32	Zeeland, Holland,Allendale
Ionia	30	Easton, Ionia, Otisco
Allegan	22	Casco, Overisel, Ganges
Monroe	22	Milan, Dundee, Summerfield
Clinton	21	Bingham
Saginaw	21	Albea, SwanCreek,Lakefield
Lenawee	20	Riga, Dover, Adrian
Ingham	18	LeRoy, Aurelius
Kent	16	Alpine, Grattan
Tuscola	14	
Huron	13	
Sanilac	13	Bridge Hampton, Elk
Washtenaw	12	Saline
Berrien	11	
Calhoun	11	Albion
Genesee	11	
Gratiot	10	
Hillsdale	10	
Jackson	9	Columbia
Montcalm	9	
Branch	8	
Eaton	8	
Shiawassee	8	Venice
Van Buren	8	Porter
Barry	6	Maple Grove
Bay	6	Merritt, Garfield
Kalamazoo	5	Charleston
Lapeer	5	Almont
Cass	4	
Midland	4	Homer
Mecosta	3	Big Rapids
Muskegon	3	
Oakland	3	
Wayne	3	Sumpter
Isabella	2	
Macomb	2	
Saint Joseph	2	
Saint Clair	1	
	406	

Source: DNR, Farmland and Open Space Unit, 1991

APPENDIX 5

Length of Contracts

Length	Cases	Percentage
A year or less	7	2
2 to 5 years	32	10
6 to 9 years	212	68
10 to 13 years	62	20
More than 13 years	1	0.0
	314	100

Source: DNR, Farmland and Open Space Unit, 1991.

Note: The total number of cases of termination of contracts was 566. Only 314 cases had complete information. The files of the remaining 252 cases were either missing or had incomplete information.

APPENDIX 6

Nominal Value of Farmland per Acre ($),
Michigan, 1977-1990

Year	77	78	79	80	81	82	83	84
Values	778	877	975	1111	1289	1278	1223	1223

Year	85	86	87	88	89	90
Values	1052	1012	924	971	1000	1060

Source: USDA, 1985.

Michigan Agricultural Statistics Service, 1990.

Appendix 7

Nominal Farmland Values per Acres($), per County, Southern Michigan, 1974-1987.

County	1974	1978	1982	1987
Allegan	568	1028	1313	1162
Barry	443	782	885	909
Bay	676	1230	1954	1184
Berrien	750	1221	1501	1167
Branch	453	804	1000	786
Calhoun	441	783	970	717
Cass	528	1010	1193	948
Clinton	535	911	1176	937
Eaton	529	902	1178	867
Genesee	794	1238	1277	1225
Gratiot	536	991	1592	825
Hillsdal	482	940	1169	835
Huron	534	1233	1566	1003
Ingham	662	1054	1323	1107
Ionia	457	843	1025	857
Isabella	415	745	982	680
Jackson	507	852	1068	871
Kalamaz.	685	1134	1297	1235
Kent	622	1061	1441	1274
Lapeer	713	1237	1351	1121
Lenawee	689	1318	1479	1190
Livingst	880	1293	1392	1329
Macomb	1218	1857	1952	2017
Mecosta	294	656	788	677
Midland	527	1071	1427	953
Monroe	909	1583	1701	1363
Montcalm	360	743	863	743
Muskegon	483	877	1217	1001
Newaygo	424	645	1096	802
Oakland	1401	2170	2592	2405
Oceana	404	723	1121	991
Ottawa	744	1210	1735	1754
Saginaw	692	1095	1639	1050
St Clair	746	1104	1151	1099
StJoseph	462	993	1275	1039
Sanilac	523	931	1107	764
Shiawas.	576	875	1198	873
Tuscola	680	1354	1721	1000
VanBuren	612	1039	1454	1121
Washten.	861	1391	1669	1523
Wayne	2067	2519	2647	3560

Source: Michigan Census of Agriculture, 1974, 1982, 1987;

APPENDIX 8

Consumer Price Index (CPI) USA, 1970 - 1990 (1985 = 100).

Year	Index	:	Year	Index
1970	36.09	:	1980	76.58
1971	37.62	:	1981	84.48
1972	38.87	:	1982	89.68
1973	41.28	:	1983	92.57
1974	45.84	:	1984	96.56
1975	50.03	:	1985	100.00
1976	52.90	:	1986	101.86
1977	56.33	:	1987	105.67
1978	60.63	:	1988	109.91
1979	67.47	:	1989	115.21
			1990	121.43

Source: IMF, 1991.

Appendix 9 Data on Enrollment in PA 116, Southern Michigan, 1982.

County	#farms	Acres enrolled (cumul.)	Average size of farms (acres)	Cropland: % land in farms	Average real values of farmland ($)	Land in farm (% county area)	Part-time farmers (% total farmers)	Density (pop./sqmile)	PA116 credits (% property taxes)
Allegan	1831	63171	146	81	15	50	43	100	10
Barry	1061	36083	177	73	10	53	47	82	8
Bay	1072	71702	168	89	22	63	40	264	31
Berrien	1777	28000	107	80	17	52	42	287	19
Branch	1170	86312	208	77	11	75	46	77	21
Calhoun	1281	75886	208	76	11	59	45	196	20
Cass	1022	56980	194	77	13	63	43	98	18
Clinton	1518	109425	176	83	13	73	49	97	19
Eaton	1372	50065	178	79	13	66	49	152	15
Genesee	990	29305	162	83	14	39	49	686	14
Gratiot	1215	168539	238	86	18	79	37	69	46
Hillsdal	1354	84556	195	77	13	69	45	60	20
Huron	1655	254963	263	98	18	82	20	43	40
Ingham	1105	80856	202	83	15	62	50	485	30
Ionia	1187	64152	205	81	11	66	45	93	18
Isabella	1016	40839	198	80	11	54	43	93	11
Jackson	1242	59130	189	73	12	52	48	211	11
Kalamaz.	961	41057	184	79	15	49	48	381	20
Kent	1524	43962	146	77	16	41	47	524	28
Lapeer	1361	40476	166	79	15	54	46	106	9
Lenawee	1619	183966	232	87	17	78	43	118	35
Livingst	884	21683	156	75	16	38	48	174	5
Macomb	819	5235	111	85	22	30	41	1424	1
Mecosta	684	26647	199	68	9	38	42	66	6
Midland	502	32418	186	78	16	28	47	141	19
Monroe	1458	66456	166	90	19	68	47	237	17
Montcalm	1132	49267	213	76	10	53	39	68	18
Muskegon	481	23174	177	70	14	26	45	307	30
Newaygo	784	27315	164	69	12	24	45	42	13
Oakland	688	4830	100	73	29	12	52	1143	3
Oceana	735	26021	177	65	13	38	38	40	16
Ottawa	1573	62349	116	80	19	51	46	282	24
Saginaw	1702	146398	190	88	18	62	44	274	37
St Clair	1302	16075	158	86	13	44	47	188	2
StJoseph	1033	80745	214	82	14	69	42	114	29
Sanilac	1846	166772	241	88	12	72	28	41	24
Shiawas.	1386	76528	176	83	13	71	43	129	21
Tuscola	1483	172004	232	88	19	66	36	69	40
VanBuren	1464	46451	135	76	16	50	44	109	22
Washten.	1347	56276	166	80	19	49	45	367	16
Wayne	439	1216	85	82	30	10	45	3648	26

Source: Michigan Census of Agriculture, 1982, 1987; U.S. Department of Commerce, 1988 and 1989; Harvey and Trachtenberg, 1990; Michigan Department of Treasury, 1985, 1986, 1986-87 and 1990.

Appendix 10 Data on Enrollment in PA 116, Southern Michigan, 1987

County	#farms	Acres enrolled (cumul.)	Average size of farms (acres)	Cropland (% land in farms)	Average real values of farmland ($)	Land in farm (% county area)	Part-time farmers (% total farmers)	Density (pop./sqmile)	PA116 credits (% property taxes)
Allegan	1634	9709	155	81	11	48	42	107	17
Barry	908	48456	186	76	9	47	42	87	11
Bay	922	102910	192	91	11	62	40	260	24
Berrien	1479	49772	121	84	11	49	41	288	19
Branch	1034	121143	220	79	7	70	41	79	21
Calhoun	1166	123900	217	76	7	56	43	195	21
Cass	939	92521	232	78	9	61	42	99	23
Clinton	1333	132900	193	86	9	70	45	100	27
Eaton	1219	74668	192	81	8	63	44	160	19
Genesee	851	42935	171	87	12	35	43	676	14
Gratiot	1011	208949	279	88	8	77	40	69	38
Hillsdal	1142	118843	212	81	8	63	42	71	15
Huron	1390	318498	305	90	10	80	36	44	45
Ingham	960	92457	216	83	11	58	44	492	26
Ionia	1084	103112	233	82	8	69	43	96	20
Isabella	912	86753	214	82	6	58	41	93	15
Jackson	1103	75520	198	74	8	48	43	210	11
Kalamaz.	842	60498	200	79	12	47	43	384	25
Kent	1368	64379	149	80	12	37	43	552	33
Lapeer	1228	66166	178	80	11	52	43	112	8
Lenawee	1387	223675	249	90	11	72	42	120	39
Livingst	789	31157	163	78	13	35	43	191	5
Macomb	667	8614	119	86	19	26	42	1462	6
Mecosta	639	32148	199	70	6	35	42	68	6
Midland	459	50473	206	79	9	28	43	141	24
Monroe	1258	86568	175	93	13	62	42	243	15
Montcalm	980	87895	243	78	7	52	41	73	27
Muskegon	460	29150	179	69	10	25	43	315	15
Newaygo	687	42686	169	73	8	21	42	46	12
Oakland	596	7288	101	79	23	11	42	1193	3
Oceana	686	52972	194	65	9	38	37	42	33
Ottawa	1471	80964	121	82	17	49	42	309	25
Saginaw	1424	195082	216	90	10	59	42	265	33
St Clair	1092	30075	162	84	10	38	43	196	4
StJoseph	880	112069	243	84	10	66	42	118	25
Sanilac	1559	251263	277	91	7	70	39	43	29
Shiawas.	1160	103296	207	84	8	69	43	130	23
Tuscola	1207	220931	272	89	10	63	42	69	40
VanBuren	1278	75837	149	78	11	49	41	112	11
Washten.	1222	76360	167	84	14	45	43	372	14
Wayne	334	2209	66	86	34	6	43	3495	6

Source: Michigan Census of Agriculture, 1987; U.S. Department of Commerce, 1988 and 1989; Harvey and Trachtenberg, 1990; Michigan Department of Treasury, 1990.

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