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Farmland Conversion: The View from 1986

by

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I. INTRODUCTION

The conversion of agricultural land into other uses has become a topic of major interest for American agriculturalists, economists, lawyers, and government. The possibility that the nation might be using up its farmland reserves too quickly has spawned a considerable literature.[1] In response, nearly every state and many local jurisdictions have passed legislation designed to slow conversion through tax incentives, public acquisition of development rights, protection of farm activities, and sometimes by restrictive regulation. Concern for the future turned into alarm in the early 1980's with a great increase in foreign demand for American food and the publication of the federal government's landmark National Agricultural Lands Study (NALS) Report.[2] The NALS Report indicated that as many as three million acres of American farmland were being converted annually into other permanent uses.[3] Many observers believed that the damage to agricultural productivity was about to become fatal.

Then, just as an increasing strain on American agricultural land resources seemed to become an inevitable fact of life, worldwide food production rose, United States exports fell, and the nation faced a crisis of a very different sort—a crisis of overproduction, with bulging storage bins, declining prices and farm income, massive set-aside and support programs, food give-aways, falling farmland values, rising farm debt, and a terrible surge of farm bankruptcies.[4] Gone were fears of imminent price

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1. Hundreds of books and articles in law and agricultural journals are available on the subject. For a recent compilation of some of them, see S. REDFIELD, VANISHING FARMLAND, A LEGAL SOLUTION FOR THE STATES 189-96 (1984).

2. UNITED STATES DEP'T OF AGRICULTURE (USDA) & COUNCIL ON ENVIRONMENTAL QUALITY (CEQ) NATIONAL AGRICULTURAL LANDS STUDY, FINAL REPORT (1981) [hereinafter cited as NALS REPORT].

3. NALS REPORT, *supra* note 2, at 13-17.

4. Although the nation's media has featured the plight of American farming for months, the crisis has been building for years, as hundreds of dismal statistical reports have thoroughly documented. For the Midwest, a single figure may best summarize the bad news: in 1983, the Corn Belt region as a whole actually posted negative net farm income, even after more than $2 billion in federal payments. COMPTROLLER GENERAL, GENERAL ACCOUNTING OFFICE, PUB. NO. GAO/RCED-86-09, REPORT TO THE CONGRESS, FINANCIAL CONDITION OF AMERICAN AGRICULTURE at App. II, p. 33 (Oct. 10, 1985) [hereinafter cited as FINANCIAL CONDITION]. Meanwhile, farmland values

increases caused by agricultural land shortages; instead, attention focused on ways to bolster the sagging farm sector.

This article re-assesses the agricultural land conversion issue in light of the current excess of production. Surely some of the premises behind the original rush to farmland preservation laws now deserve review. On the other hand, many of these premises may remain valid, despite the lessons of the last few years. A fresh look at the whole issue is due.

The article concludes that concern about agricultural land conversion does remain legitimate, but only for a more distant future than earlier thought. A threat to agricultural productivity more remote than was feared has many implications for the goals and structures of agricultural land preservation programs. With this point in mind, the article reviews existing and proposed conversion laws to determine whether they continue adequately to address the problem. Finally, the article suggests ways to maximize the effectiveness of farmland preservation programs for that time in the future when the conversion problem may manifest itself in earnest.

II. THE SIZE OF THE PROBLEM

America has no immediate agricultural land shortage. Millions of acres of American cropland are not now in production, yet the domestic and worldwide supply of food considerably exceeds the demand. Whether the United States has an agricultural land *conversion* problem depends both on the future demand and supply of food here and abroad and on the future supply of American farmland to produce that food. Obviously, none of these variables is static. Great uncertainty must attend long-range predictions about any of these factors, as recent experience has thoroughly demonstrated. Nevertheless, demand for food may rise faster than increases in production, unless new farmland, particularly in America, enters production. Ultimately all the nation's potential cropland may be cultivated. At that point, scarcity and rising prices will likely constrain new conversion of agricultural land, and the nation will sorely regret past conversion that it could easily have avoided. The critical question is when that point in time might occur. The answer will be a

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in the Midwest have declined by about 50%. 14 LAND USE PLANNING REP., No. 15, Apr. 14, 1986, at 119. The tens of billions of dollars of federal assistance now scheduled for payment over the next several years may do no more than barely keep the farm economy afloat. *See, e.g.*, 14 LAND USE PLANNING REP., No. 1, Jan. 6, 1986, at 6. For a general discussion of the status of the American farm industry, see ECON. RESEARCH SERV. (ERS), USDA, ECONOMIC INDICATORS OF THE FARM SECTOR: FARM SECTOR REVIEW (1983); ERS, USDA, ECONOMIC INDICATORS OF THE FARM SECTOR: STATE INCOME AND BALANCE SHEET STATISTICS (1983); ERS, USDA, ECONOMIC INDICATORS OF THE FARM SECTOR: COSTS OF PRODUCTION (1983); ERS, USDA, ECONOMIC INDICATORS OF THE FARM SECTOR: INCOME AND BALANCE SHEET STATISTICS (1983) [hereinafter cited as INCOME AND BALANCE SHEET STATISTICS]; ERS, USDA, ECONOMIC INDICATORS OF THE FARM SECTOR: PRODUCTION AND EFFICIENCY STATISTICS (1983) [hereinafter cited as EFFICIENCY STATISTICS]. *See also* T. FREY & R. HEXEM, MAJOR USES OF LAND IN THE UNITED STATES 1982 (1985); Rose, *Farmland Preservation Policy and Programs*, 24 NAT. RESOURCES L.J. 591 (1984).

function of many diverse and complex factors. The following discussion assesses these factors individually, with particular reference to predictable conditions for two dates in the future, the years 2000 and 2020.[5]

A. Demand for Food

1. Population Growth

The future demand for American food will be related to the national and world populations, the standard of nutrition that future populations will desire and can afford, and the capacity of the rest of the world's agricultural systems to meet those needs and desires. The first obligation of the nation's agricultural system will be to feed its own people. Demographers expect the United States to show steady population growth in coming decades, starting from a 1986 base of 240 million.[6] The growth rate will be influenced by several variables,[7] especially the birth rate[8] and the pace of legal and illegal immigration.[9] Most demographers expect moderate growth of about one percent per year or less. Although a wide range of predictions exists, typical projections put the nation's population at about 270 million in the year 2000 and 300 million in 2020.[10] From today's base figure, these estimates represent an increase of

5. The author selected these two years because, although the dates do represent the long-range future, the years are not so far distant that predictions about them would be mere speculation, and because demographic projections are readily available for those years.

6. The United States population reached 240 million in late January 1986, based on projections from provisional statistics for July 1985. *See* 13 POPULATION TODAY, No. 12, at 7 (1985).

7. For example, the nation may hope for slight decreases in infant mortality and modest increases of two or three years in life expectancy in the next generation. *See* BUREAU OF THE CENSUS, UNITED STATES DEP'T OF COMMERCE, CURRENT POPULATION REPORTS: POPULATION ESTIMATES AND PROJECTIONS, Series P-25, No. 922, Oct. 1982, at 1 [hereinafter cited as POPULATION ESTIMATES AND PROJECTIONS]; *U.S. Population: Where We Are; Where We're Going*, 37 POPULATION BULL. 2 (1982) [hereinafter cited as *U.S. Population*]; Gardner, *Asian Americans: Growth, Change, and Diversity*, 40 POPULATION BULL., No. 4, at 19 (1985).

8. About 60% of America's population expansion is due to natural increase. The current birth rate is about 1.6% per year. The nation's highest birth rate was about 5.5% in the early 18th century. The rate was 2.5% at the peak of the "baby boom" in the 1950's and 1.5% during the "baby bust" of the 1970's. *See U.S. Population, supra* note 7, at 7-11.

9. The United States admits more legal immigrants than the rest of the world combined, and the flow of illegal immigrants may equal or exceed this rate. *See* Teitelbaum, *Right versus Right: Immigration and Refugee Policy in the United States*, 59 FOREIGN AFF., No. 1, at 21, 25 (1980). The combined rate may exceed one million immigrants per year. Furthermore, substantial new pressures for immigration may exist. Population in the Caribbean and Central America, the largest contributors to immigration to the United States, may increase by 54 million in the next 15 years and by 126 million in the next 35 years. PRB, 1985 WORLD POPULATION DATA SHEET [hereinafter cited as DATA SHEET]. If economic conditions cannot keep pace with this growth, rising unemployment, severe rural and urban overcrowding, declining standards of living, malnutrition, and political instability may result. These consequences would heighten pressures for emigration. On the other hand, the United States may impose stricter limits on legal immigration, and, if it can, on illegal immigration to reduce the flow.

10. *See U.S. Population, supra* note 7, at 44-45. The range of estimates usually runs from about 250 million to 290 million for the year 2000 and from 260 million to 340 million for 2020. *Id.* at 46. But if fertility rates rose to 2.2% (from 1.8% currently) and total immigration rose to 2 million per year, United States population would approach 440 million by the year 2030. See L. BOUVIER, THE IMPACT OF IMMIGRATION ON U.S. POPULATION SIZE 4, Table 2 (1981).

about 30 million and 60 million for those dates respectively, or proportionate increases of twelve-and-one-half percent and twenty-five percent.

In an increasingly interdependent world, one must also consider potential demand for American food from abroad. The foreign share of United States production rose from approximately ten percent in 1950 to about a third in 1981, although it has since fallen off again.[11] Population growth abroad obviously could affect future export prospects. Unfortunately, except for immigration, all the factors contributing to uncertainty about internal growth rates apply as well to worldwide estimates, some of them with more force.[12]

Future worldwide population increases may be substantial. Current growth rates are high,[13] especially in the Less Developed Countries (LDCs). Few demographers expect growth rates to decrease dramatically in the near future. Most models for world population growth assume that growth rate reductions will occur largely in the LDCs and that the rate of increase will diminish gradually until it reaches equilibrium. Even if equilibrium is reached, the built-in momentum for growth that already exists ensures that overall absolute increases will be large.[14] Presently, more than eighty million persons per year are added to the world's population base; with reductions in birth rates, that figure is expected eventually to drop. The decrease, however, will not occur for many years, because of the large cohort of children, soon to be parents, around the world.[15] Average projections suggest a world population (in-

11. Although exports rose to more than a third of United States production, they have since receded. *See* USDA, A TIME TO CHOOSE: SUMMARY REPORT ON THE STRUCTURE OF AGRICULTURE 23 (1981) [hereinafter cited as A TIME TO CHOOSE]; NALS REPORT, *supra* note 2, at 37; ERS, USDA, WORLD AGRICULTURE OUTLOOK AND SITUATION REPORT NO. WAS-40, at 7, 8 (June 1985) [hereinafter cited as WORLD OUTLOOK].

In the year ending October 1, 1981, the United States exported 162.3 million tons of agriculture products, with a value of $43.8 billion. For the year ending October 1, 1986, the forecast is for exports of 115.5 million tons, with a value of $27.5 billion. ERS, USDA, OUTLOOK FOR U.S. AGRICULTURAL EXPORTS 1, table 1 (May 21, 1986) [hereinafter cited as OUTLOOK FOR U.S. AGRICULTURAL EXPORTS]. However, more than one-third of the nation's farmland continues to be devoted to production for export. Edwards, *A Future Tied to Exports*, FARMLINE, June 1986, at 4.

12. For example, mortality rates could decrease significantly, and thereby increase population. Life expectancy in the less-developed countries of Africa, Asia and Latin America averages about 50 years and is 17 years less than the United States life expectancy. *See* DATA SHEET, *supra* note 9. On the other hand, birth rates in some regions could also decline significantly, decreasing population growth. For example, Africa's birth rate is 4.5%; Europe's rate is only 1.3%. *Id.* Dozens of countries have announced goals to restrain population growth and many countries actively encourage and subsidize birth control and sometimes sterilization and abortion programs.

13. The current worldwide average birth rate is about 2.7%; the present worldwide annual rate of population increase is 1.7%. *Id.*

14. For example, China has embarked on a widely hailed "one child per family" program to control its population growth. Even if such a drastic measure succeeds, the country's population will still rise by another 150 to 350 million before leveling off. *See* Yuan Tien, *China: Demographic Billionaire*, 38 POPULATION BULL., No. 2 (1982). Many countries have had difficulty instituting programs to curtail population growth. If such efforts are too coercive, governments may fall instead. *See, e.g.*, Visaria & Visaria, *India's Population: Second and Growing*, 36 POPULATION BULL., No. 4 (1981).

15. DATA SHEET, *supra* note 9. The percentage of the population under 15 years of age in the LDCs is nearly twice that of the United States. *Id.*

cluding the United States) of 6.135 billion by the year 2000 and 7.760 billion by 2020.[16] To put these figures in perspective, the world's population in 1920 was approximately two billion; it is 4.890 billion today.[17] Thus, the *increase* anticipated in the next thirty-four years is nearly one and one-half times the world's entire population in 1920.

If demand for food were a function only of numbers of consumers, the United States' domestic food needs would be twelve-and-one-half percent higher in the year 2000 and twenty-five percent higher in the year 2020, given these predictions. World needs would be approximately twenty-five percent and sixty percent higher for those years. These raw projections underlie much of the expected future demand for food. Such projections ensure that pressures on agricultural land will exist the world over.

2. *Nutritional Standards*

Anticipated changes in nutritional standards will also affect future demand for food. Although such changes can have an important effect on overall demand, they are difficult to predict. Affluent populations in the West may not require much additional food *per capita* to meet any rising expectations about diet, especially if concerns about health go from the jogging track to the dinner table.[18] In the United States, only moderate increases in agricultural demand are expected from increased nutrition, perhaps five percent by the year 2000 and ten percent by 2020.[19]

16. *Id.* Most demographers predict (or hope) that the rate of increase will decline after 2020 and that population will level off at about 10 or 12 billion in approximately one hundred years. *See, e.g.*, Brown, *World Food Resources and Population: The Narrowing Margin*, 36 POPULATION BULL., No. 3, at 28 (1981). Of course, the final population figure could be billions higher if growth rates do not begin to decrease now. *See* C. MCEVEDY & R. JONES, ATLAS OF WORLD POPULATION HISTORY 351 (1978).

17. The 4.890 billion figure is for the beginning of 1986. By October 1986, world population should have increased by more than 60 million. *See* DATA SHEET, *supra* note 9; 13 POPULATION TODAY, No. 12, at 7 (1985).

18. Physicians now associate meat and dairy products with health risks. In the United States, annual *per capita* consumption of animal products actually declined from 611 pounds to 583 pounds, from 1963 to 1983. ERS, USDA, FOOD CONSUMPTION, PRICES, AND EXPENDITURES, 1963-83, STAT. BULL. No. 713, at 9, Table 2 [hereinafter cited as FOOD CONSUMPTION]. The influence of fashion and cultural taste may also reduce food intake. *See* S. MENNELL, ALL MANNERS OF FOOD 36-39 (1985). The average *per capita* daily food energy intake in the United States was nearly the same (3,450 calories) in 1983 as it had been 70 years earlier. *See* FOOD CONSUMPTION, *supra*, at 37, Table 28. This exceeds basic needs by nearly 40%. In some European countries, the excess approaches 50%. *See* E. MURPHY, FOOD AND POPULATION: A GLOBAL CONCERN 8 (1984).

19. Rising middle and upper class incomes in America would probably have little effect on food intake. Meanwhile, after dropping significantly in the 1960's, the United States' poverty rate rose in the early 1980's and now seems to resist major improvement. *See, e.g.*, O'Hare, *Poverty in America: Trends and New Patterns*, 40 POPULATION BULL., No. 3 (1985). Because a significant part of the nation's population increases are expected to come from its poorest sector and from immigrants, the poverty rate may not decrease. The NALS Report predicts increases in *per capita* food demand of about one-third of one percent per year, assuming constant food prices. NALS REPORT, *supra* note 2, at 35. A 0.33% increase is about twice the actual rate of increase for the period 1963-1983, when *per capita* consumption of all foods rose from 1368 to 1417 pounds. FOOD CONSUMPTION, *supra* note 18, at 11, Table 3. Other developed societies also anticipate only modest nutritional

As people move from subsistence toward affluence, however, they expect to consume more food.[20] People also expect a better diet qualitatively, especially more meat and dairy products. Because more land is needed to produce meat and dairy products than basic grains,[21] the result can be a considerably higher demand for farmland than mere numbers of people would indicate. For those countries which may be condemned to chronic hunger, no nutritional improvements will be forthcoming, of course. But for the billions who anticipate that their living standards will rise above subsistence, improvements of diet could swell demand for food. Living standards generally are projected to rise in the future, even after accounting for population growth.[22] Accordingly, nutritional standards could also rise.[23] For those nations that can afford to pay, higher living standards will increase economic demand for food. For those nations left behind, reserve food stocks will be necessary to supply dietary supplements, and this too may affect demand.[24]

An expected qualitative improvement in diet will have two consequences. The first is that the gross demand for food should rise faster

changes. *See, e.g.*, Hemmi, *A Japanese Perspective*, in AGRICULTURE IN THE TWENTY-FIRST CENTURY 326, Table 6 (J. Rosenblum ed. 1983).

20. Increases in diet can easily occur in many LDCs. For example, at only 1700 calories daily *per capita* consumption, Ethiopia is in the midst of famine and malnutrition; China's horrific famine of the 1950's may have involved levels as low as 1500 calories. *See* Ashton, *Famine in China, 1958-1961*, 10 POPULATION & DEV. REV., No. 4 (1984), *reported in* 13 POPULATION TODAY, No. 3, at 7 (1985). Subsistence nutritional standards require about a pound of grain per person per day. African production has slipped well below that level for the entire continent. At the same time, in both the United States and the Soviet Union, grain production *per capita* is nearly five times the minimum necessary for subsistence levels, with much of that grain going to produce meat. *See* L. BROWN & E. WOLF, REVERSING AFRICA'S DECLINE 8 (Worldwatch Paper No. 65, June 1985); Brown, *supra* note 16, at 23.

21. Approximately five tons of grain are necessary to produce one ton of meat in the United States. Other countries are less efficient—in the Soviet Union, for example, the ratio is about eight tons of grain to one ton of meat. *See* L. BROWN, U.S. AND SOVIET AGRICULTURE: THE SHIFTING BALANCE OF POWER 14 (Worldwatch Paper No. 51, Oct. 1982). Worldwide meat consumption exceeds 117 pounds *per capita* and may account for half of all grain produced. *See* WORLD OUTLOOK, *supra* note 11, at 14; Briskey, *Nutritional Needs for the Twenty-First Century* in AGRICULTURE IN THE TWENTY-FIRST CENTURY 119 (J. Rosenblum ed. 1983).

22. *See, e.g.*, WORLD OUTLOOK, *supra* note 11, at 4. Under the most widely accepted demographic transition theories, if living standards fail to rise, birth rates will not drop as rapidly as anticipated, making estimates about population growth too conservative. In either case, the result is an increase in food demand that exceeds mere numerical extrapolation from currently projected population increases.

23. Nutritional standards have been rising for decades. World *per capita* grain production was 251 kilograms in 1950, 285 kilograms in 1960, 309 kilograms in 1970, 324 kilograms in 1980, and should be 341 kilograms in 1986. The only year that the *per capita* figure exceeded the most recent figure was in 1978 (351 kilograms). *See* Brown, *supra* note 16, at 5; WORLD OUTLOOK, *supra* note 11, at 7-11. World-wide *per capita* production of all food rose at an annual rate of approximately 1% between 1950 and 1980. J. SIMON, THE ULTIMATE RESOURCE 57 (1981). Given concomitant population growth, absolute production more than doubled during that 30-year period.

24. If the United States must donate this food rather than sell it, the nation will face some wrenching foreign aid decisions. For example, in the early 1980's, as many as 100 million Africans may have suffered from chronic hunger. INDEPENDENT COMM. ON INT'L HUMANITARIAN ISSUES, FAMINE, A MAN-MADE DISASTER? 26 (1985). If, as expected, Africa's population doubles in the next 25 years, its agricultural production continues to stagnate as it has for the last two decades, and another predictable, cyclical drought occurs, then even more Africans will suffer.

than the world's population. The second is an additional significant uncertainty in estimates of food demand: the amount of qualitative improvement, which will be a function of world economic development, is very hard to predict. The improvement might be minimal; but if real economic growth occurs in the LDCs, *per capita* nutritional improvement in those countries could be as high as seventy-five percent in the next twenty years.[25] Gains of up to ten percent by the year 2000 and twenty-five percent by 2020 are well within the potential grasp of many economically emerging nations around the world.

These estimates are sobering. If rising nutritional standards compound population growth, agricultural demand in the United States should increase as much as eighteen percent by the year 2000, and thirty-eight percent by 2020. World demand could *double* by 2020, if nutritional gains average twenty-five percent. Such increases in nutritional standards will not be realized equally everywhere. Nor will all of the world's demand for new food fall on American agricultural land reserves. New foreign production will meet most of the demand helped by expansion of the land under cultivation, and, especially, increases in the productivity per unit of land cultivated.[26] Worldwide productivity is generally expected to rise significantly in the next two or three decades, but predictions about the size of the increase differ widely.

3. *Expected World Production and Imports*

World prospects for agricultural production are a critical part of anticipated demand for American food. Although worldwide production has been increasing for a long time, growth has been erratic geographically. In some places production has not increased at all, while in other places, such as where the "green revolution" has taken hold, the increase has been spectacular.[27] Future increases in the world's production may decline as agriculture confronts limits of water and arable land and as marginal gains in productivity, derived from the use of chemicals, diminish with rising use. On the other hand, production levels should rise at least part way to meet increased demand—especially if food prices increase.

Theoretically, the world outside the United States could support many times its present population, using farming technology that is already available.[28] Unfortunately, actual production will never approach

25. Briskey, *supra* note 21, at 121.

26. Increased production must come mainly from productivity gains, however. Only the United States has great reserves of unused cropland. As little as four percent of the current farm land worldwide may be available for further new expansion by the year 2000. *See* Brown, *Reducing Hunger*, in STATE OF THE WORLD 1985, at 24 (Worldwatch Inst.).

27. For example, India seems poised to become a net exporter of wheat and rice. *See* WORLD OUTLOOK, *supra* note 11, at 25. In contrast, Africa, plagued with drought and a faltering economy, has actually experienced a decline in *per capita* grain production of about 33% since the 1950's. *See, e.g.*, L. BROWN & E. WOLF, *supra* note 20, at 8-9.

28. In a 1982 study, the Food and Agriculture Organization of the United Nations (FAO)

the theoretical maximum—too many economic, cultural, educational, political, and international obstacles exist, including the intractable problem of equitably distributing the food that is produced. No one expects them to disappear in the near future.[29] The impact that any or all of them will likely have two or three decades in the future is almost impossible to quantify. Equally difficult to estimate are the economic and political incentives that various countries will have to expand production, either for export or for domestic consumption. Finally, estimates of domestic conditions which may affect the future competitiveness of America's farm exports, such as the strength of the dollar or the size of the federal deficit, are also difficult to make.

Only a short time ago, predictions about world production levels and import needs were made with some confidence. The NALS Report, for example, announced that future export growth was "assured" and predicted that export demand would "nearly triple" in twenty years.[30] Instead, such countries as China, India, Indonesia, and Saudi Arabia confounded all expectations. These countries increased production, nearly to self-sufficiency, in such basic foods as wheat and rice, and even began exporting foods in competition with the United States.[31] American farm exports have actually declined by more than one-third from their peak levels.[32]

As a result, most agricultural economists are now much less eager to engage in any long-term predictions about future exports. The USDA publishes its estimates only one year in advance. Even internal estimates of exports are made no more than five years in advance, and all predictions are carefully hedged with acknowledgments of the uncertainty that must attend them.

Nevertheless, no rational consideration of agricultural land preservation can proceed without *some* estimate of anticipated levels of export demand. Barring dramatic new technological advances, and notwithstanding recent trends and the current glut, export demand will likely rise in the future. It is tempting to assume that worldwide growth rates

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estimated that the LDCs, by applying a high level of modern agricultural technology, could feed nine times their projected population by the year 2000. With low inputs of technology, however, the LDCs could feed only 1.5 times their projected year 2000 population, and with intermediate inputs, 4.1 times their projected population. *See* E. MURPHY, *supra* note 18, at 11.

29. In many countries, radical improvements are necessary in the whole social and economic infrastructure, as well as in rural land tenure systems and tyrannical governments dominated by urban and military elites. *See, e.g., A Decade of Famine*, 2 ETHIOPIA PROFILE, Nos. 9 & 10, at 8 (1983).

30. NALS REPORT, *supra* note 2, at 37-38.

31. WORLD OUTLOOK, *supra* note 11, at 9, 21, 25, 26. The turn-around in China, for example, has involved a "phenomenal" 49% growth in agricultural output in the seven years from 1978 to 1984. ERS, USDA, AGRICULTURAL OUTLOOK 22 (Mar. 1985). Recent reports suggest that China's production may now be tapering off. *See* 298 THE ECONOMIST, No. 7429, Jan. 18-24, 1986, at 30.

32. Exports in 1981 totaled $43.8 billion; the fiscal year 1986 forecast is $27.5 billion. OUTLOOK FOR U.S. AGRICULTURAL EXPORTS, *supra* note 11, at 1, table 1. *See also* FINANCIAL CONDITION, *supra* note 4, App. I, at 7.

and *per capita* improvements will be uniformly distributed and then to factor in only a rough estimate of how these factors may translate into future import levels. Unfortunately, neither population growth, nor economic growth, nor increases in agricultural production will be uniform. A more accurate, though still highly speculative, assessment requires at least some breakdown by world regions. Perhaps the most reliable way to make that assessment is to review expectations for the basic cereal grains.[33] Cereal grains represent by far the most important part of cropland production all over the world, and comparative figures are readily available for them. Projections of future demand for cereal grains should approximate predictions for all foods.

Increases in grain demand for Europe, including Eastern Europe, should be negligible. This area may already have approached its maximum level of diet, and populations there have either leveled off or are declining. Nor should Australia or Canada add to demands on the export market. The expected population growth of these two countries is modest in absolute terms, and internal production increases should easily accommodate any increased demand.

The story could be very different for the rest of the world. Rising populations and better living standards should generate substantial demand for more food. Internal production may not be entirely able to keep pace. Using existing production and consumption data and current projections about future demand and production, it is possible to estimate future import requirements for the major world regions. Based on moderate, mid-range projections,[34] reasonable estimates for net grain import requirements beyond current import levels are: for the Middle East and North African region, twenty-five million metric tons by the year 2000 and sixty-seven million tons by 2020;[35] for the Soviet Union, fifteen million tons for both of these years;[36] for the rest of Asia, thirty-two

33. Basic cereal grains include wheat, rice, corn, and other coarse grains, such as barley, sorghum, oats, millet, and rye. *See* WORLD OUTLOOK, *supra* note 11, at 11.

34. This article uses grain production and consumption and export and import figures from WORLD OUTLOOK, *supra* note 11, at 7-14. Population projections are from DATA SHEET, *supra* note 9.

35. The region should experience rapid population growth, from 242 million in 1985 to 361 million in 2000 and 535 million by 2020. For some, although not all countries in the region, economic development should be substantial, notwithstanding the current, but probably temporary weakness in oil prices. *See* C. FLAVIN, WORLD OIL: COPING WITH THE DANGERS OF SUCCESS (Worldwatch Paper No. 66, July, 1985). Thus, for the whole region, an average 5% rise in nutritional standards by 2000 and a 15% rise by 2020 should be possible. Food demand might reasonably be expected to rise 57% by 2000 and by about 154% by 2020. From consumption of 93 million metric tons in 1984-85, this demand would mean an increase of about 53 million tons in 2000 and 143 million tons in 2020. Currently, 47% of the region's consumption is imported. For poorer countries in the area, this reliance on imports may have to decrease as population rises. For other countries with oil wealth and a very dry climate hostile to agriculture, reliance on imports may actually increase. For the region as a whole, the author assumes that the current ratio of imports to consumption will continue. Thus, the region will import about 25 million tons of grain in 2000 and 67 million tons in 2020, making it the world's largest food importer.

36. The Soviet population, 278 million in 1985, is expected to rise to 316 million in 2000 and 364 million by 2020. The country has great land resources, but a cold and often dry climate. *See,*

million and fifty million tons, respectively;[37] for Latin America, eleven million and eighteen million tons;[38] and for sub-Saharan Africa, seventeen million and thirty-five million tons.[39] The total amount of additional

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e.g., V. MAKSAKOVSKY, THE ECONOMIC GEOGRAPHY OF THE WORLD (1979). Vast Siberian river diversion projects could help agriculture, but not for years and only at enormous expense. *See* CENTRAL INTELLIGENCE AGENCY, USSR AGRICULTURE ATLAS 25 (1974). The Soviet economic system also may impose critical constraints on agricultural productivity. *See* L. BROWN, *supra* note 21, at 16-25. If a labor shortage develops, future demographic limitations also may constrain agricultural productivity. *See* Feshbach, *The Soviet Union: Population Trends and Dilemmas*, 37 POPULATION BULL., No. 3 (1982). The Soviet Union also may have to curtail traditionally heavy capital investments in agriculture in favor of high technology. *See* Goldman, *Gorbachev and Economic Reform*, 64 FOREIGN AFF., No. 1, at 56 (1985). Meanwhile, expectations of improvements in diet, especially the availability of meat, may cause increased consumption. The primary limitation on future grain imports may be that imports are already high at 35 million tons. The Soviet government is unlikely to tolerate the cost and embarrassment of imports much above the 50 million ton level on a regular basis. Thus, the author projects an increase of 15 million tons for the indefinite future, although wide fluctuations will probably occur from year-to-year. The all-time record level of imports of grain for the Soviet Union was 54 million tons in 1984-85. The 10-year average from 1973-82 was about 23 million tons. *See* L. BROWN, *supra* note 21, at 26, Table 3.

37. Japanese grain imports are second only to those of the Soviet Union. Japan imported 26 million tons in 1984-85. Neither Japanese population nor consumption should rise much in the future. Imports should rise about three million tons by 2000 and then level off. *See* Hemmi, *supra* note 19, at 326, Table 6. The 1985 population of the rest of Asia was 2.594 billion; the population is expected to rise to 3.263 billion in 2000 and 3.960 billion by 2020. Nutritional standards are also expected to rise, perhaps by 10% by 2000 and 25% by 2020. Therefore, total demand could increase by almost 90% by 2020. Production is also expected to rise considerably, as it recently has in many of the continent's largest countries. Consumption of grain in 1984-85 was 594 million tons, but only 17 million tons were imported. The author assumes that the future ratio of imports to total consumption for the rest of Asia will double to 5.6%. If so, additional grain imports will climb to 29 million tons in 2000 and about 47 million tons in 2020. Including Japan, Asia as a whole will import 32 million tons in 2000 and 50 million tons in 2020.

38. Latin America's population in 1985 was 406 million. The number is expected to rise to 554 million by 2000 and 752 million by 2020. If anticipated economic growth materializes, *per capita* consumption may also rise by 10% in 2000 and 25% in 2020. If so, consumption will rise by as much as 48 million tons in 2000 and 126 million tons from the 1984-85 level of 96 million tons. Net imports presently account for only about 2.3% of consumption. (With high inputs, the FAO estimates that South America could feed 31.5 times its expected year 2000 population. *See* E. MURPHY, *supra* note 18, at 11.) With population rising so quickly, however, prudence suggests that imports may also increase. The author assumes that the ratio of imports to consumption will quadruple over present levels. If so, additional grain imports for 2000 would be about 11 million tons and, for 2020, about 18 million tons.

39. In 1985, sub-Saharan Africa numbered 423 million inhabitants. In 1950, the area's population was only 162 million. *See* C. MCEVEDY & R. JONES, *supra* note 16, at 206. Explosive growth is expected to continue, with the population reaching 769 million in 2000 and 1.151 billion by 2020. Poverty may curtail any *per capita* food increases. But even a modest 10% nutritional advance from the present depressed levels would push consumption of grain from the 1985-86 base of about 60 million tons to about 106 million tons in 2000 and 180 million tons by 2020. In theory, the area could produce this level of grain and more with high inputs. The FAO estimates the area could feed 16 times its projected year 2000 population. *See* E. MURPHY, *supra* note 18, at 11. (The author lived in Ethiopia in the 1960's, when FAO and other experts concluded that country's economic future lay in agricultural *exports*.) Nonetheless, the region currently imports one-sixth of the grain it consumes. The major limit on future imports may be an inability to pay for them. *See* Goliber, *Sub-Saharan Africa: Population Pressures on Development*, 40 POPULATION BULL., No. 1 (1985). A cautious, perhaps optimistic forecast might call for imports to comprise a quarter of all grain needs in the future. If so, imports would have to increase about 17 million tons in the year 2000 and about 35 million tons by 2020. Although the region will have difficulty paying for these imports, caution suggests factoring in the full amount in a discussion of long-range, American land planning issues.

grain that these regions might have to import thus totals 100 million tons for 2000 and 185 million tons for 2020.

In proportional terms, the projected increase for the year 2020 is nearly one-hundred percent of all current world grain trade, almost twice current United States grain exports, and about sixty percent of current total grain production in the United States.[40] Of course, the United States will not be obliged (or able, competitively) to meet all of this increase by itself. On the other hand, the United States should certainly satisfy a significant share of any increase. What will that share be?

Led principally by Canada, Australia, Argentina, and the European Economic Community, America's competitors have entered the international grain market with unexpected vigor, and have increased their production substantially, sometimes with the aid of aggressive government subsidies and supports.[41] Nonetheless, the United States currently holds about fifty percent of the world's grain trade.[42] Despite recent trends, the United States probably will maintain this position for the long-range future, although as noted, this projection requires assumptions about the nation's trade and budget deficits, the strength of the dollar, and the country's agricultural support policies.[43] Although many short-term projections suggest that the United States will be unable to retain half the world's export market, prudence dictates use of an optimistic, long-range projection in estimates of future American agricultural land needs.

If the United States does retain half of the world grain export market, the assumptions above indicate that the country will export about fifty million more tons of grain in the year 2000 and about ninety-threee million tons more in 2020 than today. If soybean export projections are similarly factored into the calculation, then nearly all United States food export increases can be estimated. Thus, the United States should export about sixty-two million more tons of food in 2000 and about 115 million more by 2020.[44] From these totals, it is possible to estimate the addi-

40. In 1984-85, total world trade in wheat, rice, and coarse grain combined was about 187 million tons. The United States produced about 312 million tons, consumed 200 million tons, and exported 97 million tons. The balance went into storage. *See* WORLD OUTLOOK, *supra* note 11, at 9-11.

41. *See, e.g.*, Sheevers, *U.S. Wheat Faces a World of Competition*, FARMLINE, June 1985, at 4.

42. WORLD OUTLOOK, *supra* note 11, at 9-11.

43. Because predictions are necessarily tied up with political implications, the USDA declines to offer long-range guesses. In the NALS Report, the USDA envisioned a more dominant United States position, perhaps as high as nearly two-thirds of the world grain market by 2000. NALS REPORT, *supra* note 2, at 37.

44. The United States maintains about a 55% share of world trade in soybeans and soybean products. The author assumes the United States will maintain this share. In total, all countries imported a little over 40 million metric tons of soybeans, meal, and oil in 1984-85. WORLD OUTLOOK, *supra* note 11, at 14. If world soybean imports rise by 53% in 2000 and 99% in 2020, as projected above for grains, then 21 million and 40 million additional tons of soybeans will be imported in those years. The American share of the increased exports will be about 12 and 22 million tons, respectively.

Grains and soybean products constitute the bulk of net United States trade in food. Meat, poultry, and dairy product exports (forecast at $4.2 billion in 1985) are offset by imports ($4.3 bil-

tional American cropland that would be necessary at current average productivity levels to meet additional export needs: fifty-seven million more acres by 2000 and 106 million more acres by 2020.[45]

The additional acres necessary to meet increased domestic needs can be estimated more confidently. For the year 2000, thirty-four million additional cropland acres and, for 2020, seventy-one million acres will be required.[46] By adding the export and domestic figures, aggregate new demands on American cropland can be projected. Approximately ninety million acres of new cropland will be needed by the year 2000 and a little less than 180 million acres will be necessary by 2020.[47]

These cropland estimates rely upon a host of speculative hypotheses, including such imponderables as population growth, dietary aspirations and, above all, myriad economic assumptions. The estimates assume average projections when such precision is feasible and moderate guesses when precision is impossible. The future *might* be very different—the cumulative margin for error is concededly enormous. Nevertheless, the projected needs do represent a careful and reasonable estimate. As noted, some estimate is an absolute prerequisite to any rational attempt to make long-range land use plans. These projections will be the basis for further discussion.

The urgency of the farmland preservation issue turns on whether American cropland reserves will be sufficient to meet the anticipated new foreign and domestic consumption needs. The answer to whether reserves will be sufficient depends upon the inventory of cropland reserves, an estimate of how future technological advances might affect

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lion). Of course, these other products are only partially related to cropland use, as opposed to pastureland and rangeland use. Other crop exports, such as cotton and tobacco, are not food products. The only remaining significant United States agricultural exports are horticultural products ($2.6 billion) and "others" ($1.0 billion). *Id.* at 8.

45. These figures are based on 1983 data showing that 111 million acres of United States land were devoted to all food crops (not including cotton) for export. EFFICIENCY STATISTICS, *supra* note 4, at 2. The United States produced 121 million tons of grain, soybeans, and soybean products for export in 1983-84. WORLD OUTLOOK, *supra* note 11, at 9-14. On the average, therefore, the United States produced 1.09 tons of food exports per acre. Thus, if 62 million more tons of exports are expected in 2000, 57 million more acres are necessary to produce the expected exports; for 115 million more tons of exports in 2020, 106 million additional acres would be required.

46. In 1983, the United States devoted 187 million acres to production for domestic consumption of grains, soybeans, cotton, fruits, tobacco, and other products. *See* EFFICIENCY STATISTICS, *supra* note 4, at 2. Assuming that domestic demand for all of these products rises by 18% in 2000 and, 38% in 2020 *see supra* text accompanying note 25, then 34 million additional acres will be needed by 2000 and 71 million by 2020. Those estimates assume that production of non-food crops like cotton and tobacco rises commensurately with food production. The estimates also assume that domestic production meets all new United States requirements. Of course, foreign production will meet some United States needs. Agricultural imports have been rising, just as exports have been falling. Imports rose from $17.2 billion in 1981 to a projected $20 billion in 1986. OUTLOOK FOR U.S. AGRICULTURAL EXPORTS, *supra* note 11, at 1, table 1. Prudence again dictates that for long-range land planning purposes, the United States should be expected to supply all its own future needs.

47. The totals are rounded from 91 million and 177 million acres, respectively, for ease of reference and to reflect some of the large margins for error that the figures actually involve.

rates of productivity per acre, and, finally, the rate at which cropland may be lost to conversion and other factors.

B. The United States Agricultural Land Supply

The United States is blessed with extensive and fertile cropland resources. About one-fifth of the nation's total area is arable. The NALS Report, relying on 1977 data, estimated the nation's full cropland base at 540 million acres, of which 413 million acres were actually in crops, leaving a remaining reserve of 127 million acres.[48] At the time of the NALS Report, this reserve seemed on the verge of being wholly consumed by a combination of worldwide, sky-rocketing demand for food and land losses due to erosion, energy competition, conversion, and other causes. Since then, however, the picture has changed. As noted, recent exports, and more importantly, projections of future export demand, have fallen, so that concern over the rate of consumption of the land reserves has diminished. In addition, perceptions of the reserve itself have changed. A 1982 study discovered that the nation's total supply of actual and potential cropland had increased substantially, to 574 million acres.[49] Moreover, because of recent surpluses, land under cultivation has been reduced by millions of acres. Some land listed as cropland is now used for hay-pasture rotation or is kept idle, and should really be counted as reserve land.[50] Therefore, the available reserve has increased considerably. Prudence again suggests caution in assessing the actual amount of reserve available, because errors in measurements are possible and reserve land may be less productive than cropland now in production. Accordingly, a moderate estimate of the cropland reserve of 190 million acres is assumed for the purpose of future calculations.[51] Whether this

48. NALS REPORT, *supra* note 2, at 7, Fig. 1. This estimate includes both land now in crops and land in pasturage or forest cover that has a high or medium potential for cultivation. The latter category's real potential as cropland is doubtful, because the best land is probably already under plow. On the other hand, some of the land classified as having zero or low crop potential could probably be converted if a cropland shortage developed. The available pool of such low potential land is enormous—more than 800 million acres. *Id.* The amount of cultivated cropland has actually been declining for nearly 50 years. Cultivated cropland totalled 522 million acres in 1929 and 531 million acres a decade later. Since then, total acreage in crops has steadily declined. *See* USDA, SOIL AND WATER RESOURCES CONSERVATION ACT, APPRAISAL 1980, REVIEW DRAFT, Part 1, at 3-12.

49. The Soil Conservation Service (SCS) of the USDA conducts a thorough survey of United States rural land use every five years, called the National Resources Inventory (NRI). The 1977 NRI was the basis for much of the NALS Report. The figure of 574 million acres is from the 1982 NRI, Tables 31a-34a (July 1984). Part of the discrepancy between the two inventories can be attributed to more careful survey techniques in the 1982 NRI. Definitional changes may have caused some of the discrepancy. SCS sought funding to apply its 1982 techniques to the 1977 survey, so that researchers could compare the two surveys to ascertain farmland use trends; the several million dollar cost of the effort was prohibitive. The upcoming 1987 NRI, which should be published in 1988 or 1989, may reflect similar problems.

50. Since the NALS Report, the agricultural glut has taken nearly 80 million acres of cropland out of production. *See* USDA, CONVERSION BENEFITS OF 1983 PIK AND ACREAGE REDUCTION PROGRAMS: A PRELIMINARY REPORT (Mar. 1984).

51. This estimate is based on 335 million acres of cropland actually used for crops. T. FREY &

reserve will be enough to meet projected needs depends on future productivity rates and the rate of depletion for other uses.

1. United States Productivity

At current American rates of productivity per acre, 90 million additional cropland acres will be necessary to meet total projected demand by 2000 and 180 million acres will be needed by 2020.[52] Productivity is unlikely to remain stagnant, however, and therefore another complex variable must be considered.

Productivity per acre rates in the United States have been rising, though erratically, ever since the country was founded.[53] The 1960's registered remarkable increases of 1.60% per year; the rate dropped to 0.75% in the 1970's.[54] On the one hand, productivity may become progressively more difficult to increase, or even sustain.[55] On the other hand, the impact of new technologies could be significant—even startling.[56] In a few decades, per-acre agricultural productivity could in-

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R. HEXEM, *supra* note 4, at 9, Table 5. Of this amount, only 293 million acres were actually harvested. *Id.* Difficulties of definition cause minor discrepancies in the various USDA tabulations of the United States cropland in actual use. Another category of agricultural land is "prime farmland." In 1977, the United States had 345 million acres of "prime farmland," including 230 million in cropland use. *See* NALS REPORT, *supra* note 2, at 17. The 1982 NRI, at Table 34a, reported prime farmland of 342 million acres, with 233 million in cropland use. For a discussion of terminology, see Gardner, *The Market Allocation of Land to Agriculture*, in THE VANISHING FARMLAND CRISIS: CRITICAL VIEWS OF THE MOVEMENT TO PRESERVE AGRICULTURAL LAND 19 (J. Baden ed. 1984) [hereinafter cited as THE VANISHING FARMLAND CRISIS].

If the cropland base is 574 million acres, and 335 million are currently used for crops, the reserve would be 239 million. Even if the NALS reserve figure of 127 million acres is adjusted by the known 80 million acre reduction in cropland use since the report was published, the reserve is still about 207 million acres. The 190 million acre figure adopted in the paper is based on the average of these estimates, discounted by 15% to reflect caution and the probability that the best land is already in production. The cropland reserve may increase further if the farming crisis deepens.

52. *See supra* note 47 and accompanying text.

53. *See, e.g.*, Luttrell, *Reexamining the "Shrinking" Farmland Crisis*, in THE VANISHING FARMLAND CRISIS, *supra* note 51, at 36, 38.

54. NALS REPORT, *supra* note 2, at 41. Long-term productivity increases have been more dramatic. From the 1920's to 1981, United States crop yields per acre for corn rose more than 400% and for wheat, nearly 250%. *See* Schultz, *The Dynamics of Soil Erosion in the United States*, in THE VANISHING FARMLAND CRISIS, *supra* note 51, at 48, Table 4.1. Productivity rates are sometimes very sensitive to the years chosen for measurement. Although the NALS estimate for improvement in the 1970's was only 0.75% annually, another USDA source reported 17% gains in the decade ending in 1982. *See* EFFICIENCY STATISTICS, *supra* note 4, at 18, Table 13.

55. For example, gains due to mechanization and to the increased use of chemical fertilizers, pesticides, herbicides, and fungicides are likely to become more marginal compared to costs. Energy costs may again rise. Irrigation gains may decline. Climate may change, and the cumulative effects of soil erosion and air and water pollution, masked for many years by the use of fertilizers and other chemical additives, may manifest themselves. *See, e.g.*, Berry, *Threats to American Cropland: Urbanization and Soil Erosion*, in BEYOND THE URBAN FRINGE, LAND USE ISSUES OF NONMETROPOLITAN AMERICA 187 (R. Platt & G. Macinko eds. 1983); Arts & Church, *Soil Erosion—The Next Crisis?*, 1982 WIS. L. REV. 536, 555-58. In 1983, per acre productivity actually declined by 15%. EFFICIENCY STATISTICS, *supra* note 4, at 2.

56. Examples of new technologies might include genetic breakthroughs for plants and animals; increases in energy supplies, especially from nuclear sources; increases in irrigation supplies and more efficient water use; improvements in biological pest controls; reductions in erosion rates and pollution levels; beneficial climate changes; and more efficient, computerized management tech-

crease many times over.[57]

A prediction of how increases in rates of productivity may affect estimates of future land needs must necessarily be speculative, but such a prediction is an indispensable part of any useful analysis. For the sake of caution, heavy reliance on some of the more dramatic possibilities for breakthrough seems unwise; at the same time, at least some gains are very likely. This article assumes a modest rate of productivity increase of 0.5% per year, less than the actual rate of increase for the past few decades. Even at that rate, the effects on projected cropland needs are dramatic.

If annual per acre productivity gains of 0.5% are factored into estimates of cropland needs for the year 2000, new cropland requirements decrease to about 60 million acres; for 2020, the amount of necessary new cropland would be about 100 million acres.[58] For any scenario except the most pessimistic, these requirements do not seriously threaten a cropland reserve of 190 million acres—unless that reserve is too rapidly depleted by other events. Thus, the final issue for farmland preservation policies is the projected rate of depletion of the United States cropland reserve.

2. *United States Cropland Depletion*

Several factors other than agricultural land conversion may deplete the nation's reserve of cropland. Major problems include the use of cropland for energy production,[59] losses due to pollution and soil erosion,[60] and losses due to pollution and past irrigation practices and water

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niques. See, *e.g.*, Hays, *Implications for Animal Agriculture*, in AGRICULTURE IN THE TWENTY-FIRST CENTURY, *supra* note 19; Mitchell, *Implications for Plant Agriculture*, in AGRICULTURE IN THE TWENTY-FIRST CENTURY, *supra* note 19; Yermanos, Jojoba, Neuschul & MacElroy, *Crops From the Desert, Sea and Space*, in AGRICULTURE IN THE TWENTY-FIRST CENTURY, *supra* note 19.

57. If projections of possible gains in productivity are added together, total gains in 45 years could be nearly 250%, more than triple current levels. By *compounding* those gains, productivity levels might reach more than seven times current levels. *See* Wittwer, *Epilogue, The New Agriculture: A View of the Twenty-First Century*, in AGRICULTURE IN THE TWENTY-FIRST CENTURY, *supra* note 19, at 367.

58. If productivity rates remained constant, 335 million acres now in use plus 90 million new acres would be necessary in the year 2000. At an annual productivity per acre increase of 0.5%, however, the total of 425 million needed acres is reduced by about 30 million acres. Thus, only about 60 million new acres should be needed. If productivity continued to increase similarly to 2020, the total needed acreage would decrease from 515 million acres (335 million current acres plus 180 million new requirements) to about 432 million—slightly under the 100 million net increase reported as a rounded number in the text.

59. The NALS Report was written at a time when OPEC presented a rising threat to oil prices; the report predicted that as much as 500,000 acres of cropland might be diverted annually to produce fuel. NALS REPORT, *supra* note 2, at 36. *See also* Smith, *Energy From Biomass: A New Commodity*, in AGRICULTURE IN THE TWENTY-FIRST CENTURY, *supra* note 19, at 61. Strip mining operations for coal might disrupt another 300,000 acres annually. *See* CEQ 1980 ANNUAL REPORT 19. Such soil can be reclaimed, however, and need not be regarded as permanently lost. From today's perspective, a reasonable estimate is that average annual cropland losses due to all energy competition might approach 300,000 acres for the indefinite future.

60. A standard estimate of United States cropland erosion rates of about two billion tons annually puts the loss at about 1.25 million "acre-equivalents" a year. *See* Arts & Church, *supra* note 55,

supply reductions.[61] Cropland losses from these sources are difficult to predict and quantify. However, a reasonable estimate is that the depletion due to all of these factors will be about twenty-five million acres by 2000 and just over sixty million acres by 2020.[62]

Taking into account all the projections thus far considered, if cropland conversion were held to zero, the United States could anticipate unused cropland reserves of more than one-hundred million acres in 2000 and about thirty million acres in 2020. With these estimates in mind, the projected rate of conversion of cropland into non-agricultural uses can now usefully be reviewed.

3. *Cropland Conversion*

As in most other places in the world,[63] America is converting farmland to more intensive uses. In 1981, the NALS Report announced that the rate of conversion of American cropland into other uses was 675,000 acres per year.[64] This figure, however, is not beyond controversy. Some

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at 551. If soil erosion control programs take hold, this rate may decrease, although miraculous reductions are unlikely. The 1982 NRI, *supra* note 49, reports that conversion practices are already in place on 230 million cropland acres. *See also* Wittwer, *supra* note 57, at 348 (predicting that conservation tillage will double by 2000). The recently enacted federal Food Security Act of 1985, Pub. L. No. 99-198, 99 Stat. 1354 (1985), ties set-aside programs with soil conservation goals, and may achieve much. Several states have their own erosion control programs and some states are moving toward regulation. *See, e.g.*, WIS. STAT. ANN. ch. 92 (West Supp. 1985). Prudence again suggests caution in making predictions and that the full 1.25 million acre-equivalent figure be used. The effects of pollution are harder to assess. Acid deposition may depress levels of production for some crops, although a few other crops may benefit from moderate levels of acid. *See* Arts & Church, *supra* note 55, at 556. Increased atmospheric carbon dioxide may also help some crops. If the earth warms up as a result, climate changes may significantly alter patterns of agriculture but actually increase worldwide production. *See, e.g.*, Kellogg & Schware, *Society, Science and Climate Change*, 60 FOREIGN AFF., No. 5, at 1076 (1982) (noting, however, that the Midwest farm area of the United States could lose rainfall in such a situation). This article assumes a combined figure of 1.4 million acre equivalents per year for predicted future losses due to erosion and pollution.

61. Salt residues from irrigation have degraded several hundred thousand cropland acres in the United States. Groundwater tables are falling steadily in many areas, including the famed Ogallala Reservoir in the high plains area of the South Central states, which involves some 10 million acres. *See* Arts & Church, *supra* note 55, at 555-56. Of course, new supplies of fresh water may cause gains in the cropland base. For example, the Great Lakes are already being mentioned as a possible source, although not with the blessings of the bordering states. Similar issues are likely to become an important part of future interpretations of the constitutional doctrines of federalism and interstate commerce. The issues may be resolved through litigation if the political branches of government are unable to resolve them. *See, e.g.*, Commonwealth Edison Co. v. Montana, 453 U.S. 609 (1981); Wisconsin v. Illinois, 278 U.S. 367 (1929). This article assumes an annual loss of 100,000 acres of cropland in the future due to problems related to water supply.

62. These two estimates are based on the amounts assumed in the footnotes above, *see supra* notes 59-61, totalling 1.8 million acres of cropland depletion per year. Of course, these figures all represent guesses, and they may be unduly pessimistic. For example, the estimates do not account for the effect that a looming cropland shortage would have on all the constituent variables.

63. Conversion seems to occur all over the world, without apparent regard for the governing political system or even the immediacy of predictable food shortages. *See* Brown, *supra* note 26, at 25-27. One therefore might infer that conversion will be almost impossible to eliminate in the United States, with its open, democratic system of limited government, private ownership of land and current agricultural land surpluses.

64. NALS REPORT, *supra* note 2, at 13-17. The NALS figure for annual conversion of all farmland, rather than only cropland, is just under three million acres. *Id.* at 13.

commentators suggest that the figure understates the true magnitude of conversion; others argue that it greatly exaggerates conversion rates.

Few commentators suggest that the NALS Report understates what it purported to measure—the raw amount of cropland converted in the years just prior to the report.[65] Rather, those observers who conclude that the report is too optimistic argue that it does not reflect the especially high agricultural quality of the lost farmland, or the fact that some critical crops can be grown only in areas that will be subject to the most intense conversion pressure, or, most importantly, that the rate of conversion might increase in the future.

Most converted cropland is lost to the residential, commercial, industrial, and transportation pressures that attend metropolitan expansion. Of course, the location of many growing cities depends upon their proximity to productive agricultural areas. As a result, the pressures of urban expansion can be greatest precisely in the center of the most productive farmland.[66] Thus, the problem is not only that many acres may be lost each year, but that the best farmland is likely to be the first lost.

This problem can be more acute for crops that can grow in only a few regions in the United States. Population growth is not evenly distributed throughout the country. Growth is concentrated overwhelmingly in the South and West, the sunbelt.[67] The impetus for cropland conversion will be strongest in the only parts of the country able to grow winter vegetables and citrus fruits, particularly Florida, Texas, and California.[68] Thus, the real impact of conversion on consumers will be more serious than mere numbers might suggest.

Predictions about future conversion based on past rates of loss may also fail to include agricultural land rendered less productive by urban encroachment, even though not formally "converted." Pollution damage to nearby farms may increase as cities come nearer. As residential and

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65. *But see* Sampson, *Saving Agricultural Land: Environmental Issue of the 1980's*, 2 THE ENVIRONMENTALIST, No. 4, 321, 322 (1982) (arguing that between 1967 and 1977, more acres of potential cropland were lost than of actual cropland).

66. Moreover, urban expansion is attracted to the same, well-drained, level fields that are most conducive to crop production. *See* Arts & Church, *supra* note 55, at 554. Some studies, however, suggest that soil quality may relate only marginally to proximity to urban areas. *See, e.g.*, Boisvert & Bills, An *Evaluation of Administrative Changes in New York's Farmland Use-value Assessment Program*, 39 J. SOIL & WATER CONSERV. 53, 55 (1984).

67. The South and West accounted for more than 90% of United States population growth from 1980-84. 18 LAND USE DIGEST, No. 9, at 3 (1985).

68. The problem may be most dramatic in Florida, where land devoted to urban and developed areas may have tripled to 4.9 million acres in the decade prior to 1977. *See* Brown & Johnson, *Important Farmlands of Florida and Trends in their Use*, 41 PROCEEDINGS OF THE SOIL & CROP SCIENCE SOC. OF FLA. 12 (1982). The California rate of agricultural land conversion may be 150,000 acres per year. *See How Can Land Be Saved For Agriculture*, PROCEEDINGS OF A WORKING CONFERENCE TO FIND SOLUTIONS FOR CALIFORNIA, HELD AT VISALIA, CALIF., at 5 (Apr. 1983) (published by California Institute of Public Affairs). However, other studies suggest that *net* cropland losses, which averaged less than 7,000 acres a year between 1964-78, do not seem to reflect most of the farmland lost in California. During that same period, harvested cropland actually rose by more than a million acres. *See* Gardner & Wood, *Agricultural Land Use Policy: Implications for State and Local Government*, 38 CALIF. AGRIC. 6, 6-8 (1984).

other uses are mixed with farming areas, the area's attractiveness for farming may decline; in such areas the delivery of products and services is more difficult and farms are subject to more vandalism.[69] Thus, current conditions may cause a higher rate of future conversion, as farmers finally abandon their attempts to remain islands of agriculture in an incompatible metropolitan sea.

A more important factor may be that the NALS study derived its estimates for conversion from data for the years 1967-75 only. The conversion rates could accelerate due to demographic and economic trends. For example, the rate of natural population growth in the United States may be increasing again, and immigration could also increase.[70] Such trends could do more than cause food demand to increase; they also might increase the rate of cropland conversion as compared with the rate ten years ago. Moreover, *per capita* wealth is expected (and, of course, desired) to rise.[71] More urbanites may have the means to afford a second home in a rural area, a potential source of conversion pressure considerably in excess of bare population increases.[72] Another demographic trend could increase this pressure in southern states: as the American population ages steadily, more workers retire and consider a move to a rural acre in the sun.[73] In addition, as the computer and telecommunications revolution spreads in a post-industrial, mature, service economy, an increasing number of active workers may be freed from the need to be physically present in a city location, putting still more pressure on rural lands.[74]

All of these considerations suggest that the NALS estimate of 675,000 acres might be too low to serve as a prediction about future agricultural land conversion. Some commentators, however, have argued that the figure is actually too high. They question the reliability of some of the methods used to measure both the loss of agricultural land and the gains in urban areas. Even the possibility of a sort of bureaucratic skulduggery has been raised.[75]

Even a cursory review of the NALS figures reveals the possibility of doubtful methodology. For example, the Report stated that the South

69. Berry, *supra* note 55, at 185; Hite & Dillman, *Protection of Agricultural Land: An Institutionalist Perspective*, 13 So. J. Agric. Econ. 43 (1981).

70. *See supra* notes 6-10 and accompanying text.

71. *See supra* note 22 and accompanying text.

72. *See* Arts & Church, *supra* note 55, at 554.

73. The percentage of the nation's population aged 65 years and older rose from 4.1% in 1900 to 11.3% in 1980. *U.S. Population*, *supra* note 7, at 30. The figure is expected to rise to 13.1% by 2000. Population Estimates and Projections, *supra* note 7, at 1.

74. Some observers predict that in only a few years, the increase in households with at least one member working at home will be dramatic. *See, e.g.*, 18 Land Use Dig., No. 9, at 2 (1985). For many years, rural areas were the fastest growing areas in the country. However, indications are that rural growth has slowed considerably in the 1980's, slipping behind metropolitan growth rates. *See* 14 Population Today, No. 1, at 12 (1986).

75. *See* Simon, *Some False Notions About Farmland Preservation*, in The Vanishing Farmland Crisis, *supra* note 51, at 59-77.

converted agricultural land at about three times the rate in the West, at a time when the population growth rate in the West was greater than that of the South.[76] Methods which the NALS used to compute urbanization rates also have been the subject of dispute. Before the 1970's, most observers generally thought the rate of cropland conversion to urban uses was modest. One USDA study noted a rate of about 235,000 acres per year.[77] Suddenly, according to the NALS Report, the rate nearly tripled in the 1970's.[78] Critics argue that this increase was not really the result of changes in cropland conversion or urbanization rates; rather, the NALS study applied different definitions of what constitutes "urban land" to the new land totals but not the previous totals,[79] so that the NALS rate of change, based merely on a comparison of the former urban land totals with the new ones, is seriously overstated—perhaps by a factor of three or four, when other errors are included.[80] The 1982 National Resources Inventory (NRI) of the Soil Conservation Service appears to support this conclusion. The NRI shows urbanized land at only forty-seven million acres, *down* from the sixty-nine million proclaimed in NALS.[81] One interpretation of the data underlying the inventory suggests that conversion of all farmland is about one-third of the NALS figure.[82] If the same percentage applies to estimates of cropland conversion, annual conversion of cropland would total only 225,000 acres.

Some commentators also argue that rural land not now used for crop production, and not necessarily officially listed as part of the country's potential cropland, such as swampland or land that could be irrigated, might offset any conversion to urban use.[83] Moreover, future rates

76. The NALS reported that the South converted 12 million acres between 1967 and 1975 out of a total of 471.6 million acres of agricultural land. This figure is more than half of all the conversion in the United States. Meanwhile, out of 372.2 million acres of agricultural land in the West, that area converted only 3 million acres. But population in the West rose by about 54%; in the South, it rose by about 37%. *See* NALS REPORT, *supra* note 2, at 8 (Table 1), 15 (Table 5); *U.S. Population*, *supra* note 7, at 26 (Table 5). (These two references have a slight discrepancy in the stated boundary of the "South"—respecting Maryland and Delaware—although both reports refer to the same source, namely the United States Census definition.) One critic suggests that the conversion figure for the South may be distorted because of conversion to water use quite unrelated to urban expansion, especially in the Everglades. *See* Simon, *supra* note 75, at 69.

77. Krause & Hair, *Trends in Land Use and Competition for Land to Produce Food and Fiber*, in USDA, PERSPECTIVES ON PRIME LANDS, BACKGROUND PAPERS FOR SEMINAR ON THE RETENTION OF PRIME LANDS, at 8 (July 16-17, 1975) (based on the 20 year period between 1950 and 1970). For an example of the degree of factual contention that is possible even for such a relatively fixed figure as past conversion, compare these papers with Juergensmeyer, *Farmland Preservation: A Vital Agricultural Law Issue for the 1980's*, 21 WASHBURN L. J. 443, 444 (1982) (stating that in the 20 year period between 1954 and 1974, 119 million farmland acres, or nearly 6 million acres per year, were lost to suburban growth).

78. NALS REPORT, *supra* note 2, at 13.

79. *See, e.g.*, Fischel, *Urban Development and Agricultural Land Markets*, in THE VANISHING FARMLAND CRISIS, *supra* note 51, at 81.

80. Simon, *supra* note 75, at 68.

81. *See* 1982 NRI, *supra* note 49, at Table 2a; NALS REPORT, *supra* note 2, at 7, Figure 1.

82. Lee, *Land Use and Soil Loss: A 1982 Update*, 39 J. SOIL & WATER CONSERV. No. 4, at 226 (1984). *See also* Crosson, *The Issues*, in THE VANISHING FARMLAND CRISIS, *supra* note 51, at 8.

83. Simon, *supra* note 75, at 87 (arguing that the rate of conversion *into* cropland nearly

of conversion might possibly decrease, as compared with the 1970's. Decreases may occur as the "baby-bust" generation replaces the "baby-boomers" in the housing market for new households, as housing costs force more people into apartments instead of single family homes, and as energy and other costs drive up the costs of transportation and make suburban living less attractive. Furthermore, many infra-structure land use improvements, particularly highways, are already in place,[84] and less rural land will be used to build such projects. Finally, some argue that a future cropland shortage resulting from sustained higher rates of cropland conversion simply cannot make sense in a market economy. If cropland does become scarce, food prices will rise and income from the agricultural use of land will rise relative to other uses. This will cause the conversion of other land to agricultural uses, as well as reduce the depletion of cropland away from agriculture into other, now relatively less valuable, uses. Therefore, the assumption that past conversion rates could continue as an actual shortage approached must be false—the rates would instead decrease.[85]

For all these reasons, some argue that a projected cropland conversion rate of 675,000 acres per year is far too high. Some of the NALS figures do seem doubtful, especially in light of the 1982 NRI. Nevertheless, at least until more reliable data is made available, perhaps by the 1987 NRI, the most cautious approach is to accept the NALS figure with the understanding that, like all the other critical figures noted, it reflects a wide margin of error. Some studies of conversion rates on smaller, more manageable scales than the NALS suggest that its conclusions may be fairly accurate.[86] Thus, prudence suggests estimating the rate of future cropland conversion at approximately 675,000 acres.

At this point, a factual basis has finally been laid to consider the urgency of the cropland conversion issue. Using the various moderate projections and estimates indicated, the nation's cropland reserve, apart from conversion losses, should be approximately one-hundred million acres in the year 2000 and thirty million acres in 2020. If the nation converts cropland at an annual rate of 675,000 acres, a total of just under

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doubles the rate of conversion out of it due to urban expansion). *See also* Rose, *supra* note 4, at 595; Gardner & Wood, *supra* note 68, at 7.

84. Demographic factors suggest smaller households and a decline in new household formation for the late 1980's and the 1990's. *See* Sternlieb & Hughes, *Demographics and Housing in America*, 41 POPULATION BULL., No. 1, at 26-27, Table 16 (1986). For a review of the implications of energy prices, see Sternlieb & Hughes, *Energy Constraints and Development Patterns in the 1980s*, in LAND USE ISSUES OF THE 1980S 51-67 (J. Carr & E. Duensing eds. 1983). Rural land used for highways, railroads, and airports rose only 100,000 acres, or 0.4%, from 1978 to 1982. T. FREY & R. HEXEM, *supra* note 4, at 11, Table 7.

85. *See* J. SIMON, *supra* note 23, at 69; *see also* Heimlich, *Agricultural Programs and Cropland Conversion*, 62 LAND ECONOMICS 174, 175 (1986).

86. *See, e.g.*, O. FURUSETH & J. PIERCE, AGRICULTURAL LAND IN AN URBAN SOCIETY at 28-34 (1982); Dovring, Chicoine & Braden, *Evaluating Agricultural Land Use Change in Illinois*, 37 J. SOIL & WATER CONSERV. 359 (1982). In telephone interviews with the author, however, several state agricultural land program officials revealed their belief, based on their understanding of their own states but not on quantified surveys, that the NALS estimate is considerably overinflated.

10 million acres will be gone by 2000, and about twenty-three million acres will be lost by 2020. Thus, the reserve will remain substantial at the turn of the century—more than ninety million acres. Twenty years later, however, the reserve will be down to only seven million acres. If the same projections are made for a century from now (a more dubious estimate, to be sure), the United States could ultimately find itself significantly short of cropland.[87]

Of course, all of the basic assumptions made above are highly speculative. Confident predictions about future import needs, export competition around the world or technological breakthroughs are impossible to make. Pessimists might find some of the above assumptions too rosy. On the other hand, optimists could argue that the assumptions are excessively gloomy. For example, if United States productivity per acre were to rise at a 1% annual rate, instead of the cautious 0.5% rate, and all the other variables remained constant, the country could have about seventy million acres of unused cropland reserve in 2020 and might face farmland surpluses into the indefinite future.[88]

C. The Implications of the Projections

Notwithstanding the disconcerting weakness of any long-range projections, agricultural land preservation proposals must be made only with reference to such forecasts. Because all predictions about the need for farmland preservation are necessarily burdened with doubt and guesswork, the temptation is to gloss over this troublesome aspect of the issue and proceed directly to conclusions about how to deal with the preservation problem, based merely on assumed and abstract definitions of its magnitude. The temptation is so great that much of the literature in the field, especially the legal literature, does exactly this, focusing almost exclusively on legal solutions with only passing reference to precisely what it is that is being solved. Although such an approach may induce a reassuring appearance of confidence in the particular legal results advocated, it only deprives them of real value.

The untidy truth is simply that no one can be sure whether a cropland preservation problem will arise or not. It is entirely possible that there will be a future problem and that reliance on technological optimism in the face of all the future demographic possibilities would be

87. The nation could be short between 60 and 80 million cropland acres in 2086 if the following situations occur: the world and United States populations level off at about 11 billion and 360 million respectively; the post-2020 rate of increase in nutritional standards is half the rate projected to 2020; United States and worldwide productivity increases hold to the same rates projected to 2020; and United States cropland depletion due to erosion, conversion, and other causes after 2020 proceeds at a pace of one million acres per year.

88. Of course, per acre productivity rates would tend to rise if food prices rose (as a result, for example, of a shortage of cropland). If annual productivity rose by 1.5%, a rate still less than the actual rate in the 1960's, the United States in 2020 would use less cropland than today, assuming all the demand increases and depletion losses previously noted. The nation's cropland reserve would be in excess of 125 million acres in 2020.

inexcusably foolish. At the same time, preservation is unlikely to be a significant agricultural need for at least two, and more probably three or four, decades, and it may never pose a serious agricultural threat in America. Furthermore, even if the country did begin to reach its full cropland capacity, the consequences would not be immediate starvation, but only a gradual increase in the price of food relative to other prices. The United States has a substantial cushion in this respect: Americans could significantly lower their gross intake of food *per capita* and also simplify their diet considerably, while actually benefiting the national physical health.[89] Americans could also spend more of their wealth on food than they now do, stimulating more production, if necessary.[90] Finally, the United States could cut back on exports.[91] Thus, the country could ameliorate the effects of approaching cropland shortages relatively easily, without sacrificing much of its overall standard of living.[92]

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89. As previously suggested, *see supra* note 17, United States consumption of food substantially exceeds minimum requirements and even optimal levels necessary for good health. In 1983, Americans consumed an average of 583 pounds of mostly high cholesterol animal products and 834 pounds of crop products. FOOD CONSUMPTION, *supra* note 18, at 9, Table 2. The nation's risk of heart disease might well decrease if Americans consumed at least one-third less animal products. Similarly, the nation's health arguably would improve if Americans reduced their overall caloric intake by one-fifth, to 2,760 calories per day—an intake still 20% to 35% more than needed for minimum nutrition. If three pounds of grain are needed to produce one pound of animal products (the ratio for meat is nearly five to one), and animal products consumption was reduced by a third and overall food consumption by a fifth, the United States might improve its health while saving about 25% of its cropland.

90. Each farmer in the United States now feeds nearly 80 other people here and abroad. *See* EFFICIENCY STATISTICS, *supra* note 4, at 56, Table 56. In 1983, Americans spent about one-sixth of their disposable income on food; this percentage has decreased slightly over the last two decades. *Id.* at 101, Table 86; ERS, USDA, 22 NAT'L FOOD REV. 21 (1983). Nevertheless, gross farm income (less government payments) is only about five percent of the nation's personal income. *See* INCOME AND BALANCE SHEET STATISTICS, *supra* note 4, at 10, Table 2; U.S. DEPT. OF COMMERCE, SURVEY OF CURRENT BUSINESS, at 26, Table 8.2 (July 1985). This discrepancy results because about 67% of each consumer's food bill goes to prepare, package, ship, and sell the food, not to grow it. FOOD CONSUMPTION, *supra* note 18, at 97, Table 83. For cereal products, the farmers' share of the retail price dwindles to just 11%. *Id.* at 98, Table 84. Consequently, large increases in prices received at the farm (especially for basic grains) would translate into only small increases in prices to consumers. For example, if cereal prices at the farm rose to five times their current level, Americans might still be spending less than one quarter of their disposable income for food.

91. Most future exports which will be sold to other countries will be the result of rising nutritional expectations. Disquieting moral overtones should not accompany reducing these exports. Some commentators argue that proposals to disrupt United States farmland sales in an effort to depress future prices really would amount to a subsidy exacted from American farmers for the benefit of Russian consumers, who will be able to enjoy more meat. *See* Fischel, *supra* note 79, at 95. As noted, all the countries that are well-endowed agriculturally may face terrible decisions if millions of people in LDCs become dependent on food donations for their survival. The United States might respond to such a large-scale and chronic crisis by purchasing food and giving it away, although history does not provide much basis for optimism on this point. However, it is unlikely that any one sector of the economy, such as farmers, would be prepared to shoulder the burden alone.

92. The factors noted above yield dramatic results if they are compounded in combination. For example, if the nation consumed fewer calories and settled for simpler food to the degree suggested *supra* notes 89-91, and if prices paid at the farm doubled, American consumers would actually be paying less of their disposable income for food than they now spend. Moreover, the proportion of 1983 farm expenses attributable to land-related costs, such as interest on realty mortgage loans, real estate taxes, and rents, was only about one-seventh of total production expenses. *See* INCOME AND BALANCE SHEET STATISTICS, *supra* note 4, at 64, Table 43. Thus, even if a cropland shortage

Although a serious problem may never materialize, the possibility of a problem justifies at least some present concern. Certainly further study is in order, both of probable food needs and of the real inventory of United States farmland. *All* the variables described above are too imprecise; more reliable data can only result in more rational legal policies. Government agencies such as the USDA can greatly help the current debate by resuming long-range projections. Flawed as such projections must be, they are a better basis for planning and action than mere uninformed guesswork. It must surely be better to try to plan around projections based on real figures, even if the figures are partly speculative, than it is to plunge ahead in reliance on one dogma or another.

Meanwhile, it is not too early to begin addressing possible future preservation problems. If they do come, entensive programs to reduce cropland conversion will involve agencies of government at every level, particularly local governments. Years of careful organizing may be necessary to create and staff appropriate governmental institutions. Perhaps the most useful thing that governments can now do is identify which local agencies may have to address farmland preservation, and how. These agencies can then begin the immediate task of making the detailed inventories of actual farmland use and potential that will be essential for an efficient future program.

It may also be appropriate now to begin to take modest steps actually to curtail cropland conversion. The expenditure of public revenues to guard against possible future problems is always difficult to achieve in a political democracy. However, where the stakes are as high as they are in this instance, the effort is justified, and some results are possible.

On the other hand, massive new expenditures or draconian programs are not immediately necessary. Just as high risks are associated with too much complacency, severe costs can result if governments act too precipitously. Some of these costs are economic—billions of dollars may be allocated for farmland preservation.[93] Other risks are more political and constitutional. If local, rural governments prove unwilling to endorse programs which significantly curtail cropland conversion because of economic consequences to their constituents, issues of federal, state, and local relationships—federalism issues—may develop. Local governments may resort to public regulation rather than public expenditure in attempts to propitiate taxpayers by imposing the economic costs of prohibiting conversion on farmers. Such regulatory measures may raise difficult constitutional questions.[94] For some, especially for many

caused these land-related costs to rise, the actual impact on consumer prices would be greatly diluted.

93. This point concerns more than the efficient allocation of these resources. The political and social capital that could be spent in a full-scale farmland preservation effort could divert attention from other issues more important to future agricultural production, such as soil erosion.

94. The primary constitutional issue would involve the takings clause of the fifth amendment to the United States Constitution: "[N]or shall private property be taken for public use without just

farmers, these other risks may be the definitive factors arguing against the wisdom of immediate, massive legal intervention in the rural land market.

III. Current Conversion Programs

With these general parameters in mind, some of the existing programs and suggested proposals for limiting the conversion of agricultural land into other uses can be reviewed. As noted above, nearly all the states and many local jurisdictions have enacted legislation on the issue, and many proposals for further action exist. Other writers have described the programs in great detail.[95] The emphasis of this discussion will be on the actual costs and effects of the various programs.

Farmland preservation programs usually consist of one or both of two basic elements: positive financial incentives (including purchase programs and preferential tax treatment) and negative police power restrictions. Predictably, positive incentives are much more popular with most farmers. With hundreds of millions of acres potentially at issue, however, positive programs can also be very expensive. Thus, regulations on use appeal to many. However, such measures may require shifts in basic attitudes about such institutions as private land ownership and local democracy to be successful. In addition, as economists sometimes remind us, regulatory measures may actually be as expensive as more forthright financial incentive plans.

A. Purchase Programs

Most American programs have focused on financial incentives. The simplest process is for a government to buy the land outright, either on the open market or through exercise of the power of eminent domain. Governments in the United States already own nearly 900 million acres, about forty percent of all the land in the country.[96] Although very little of this land is cropland, it does include hundreds of millions of acres of grazing and forest land and represents a huge open space reserve.[97] The courts might sanction further large-scale acquisitions. The issue is not

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compensation." U.S. CONST. amend. V. The fifth amendment is made applicable to the states through the fourteenth amendment. Most states have similar provisions in their own state constitutions. *See, e.g.*, WIS. CONST. art. I, § 13.

95. For excellent summaries, see, *e.g.*, S. REDFIELD, *supra* note 1, at 95-130; O. FURUSETH & J. PIERCE, *supra* note 86, at 41-45; Massey & Silver, *Property Tax Incentives for Implementing Soil Conservation Programs under Constitutional Taxing Limitations*, 59 DEN. L.J. 485, 493-502 (1981).

96. The federal government owns 751 million acres according to the NALS REPORT, *supra* note 2, at 7, Figure 1. Another report suggests that the federal government owns 761 million acres, state and local governments own 136 million acres, and Indian tribes own 51 million acres. Therefore, out of a national gross total of 2,264 million acres, only 1,316 million acres, or 58%, are privately owned. Wunderlich, *Facts About U.S. Landownership*, AGRIC. INFO. BULL., No. 422, Nov. 1978, at 5, Table 1. Reliable figures for state and local ownership are surprisingly difficult to find. *See* Irland, *The 97-million Acre Challenge, State Public Land Programs in the 1980's*, 57 STATE GOV'T, No. 4, at 136, 140 (1984).

97. The federal government owns 466,000 acres of cropland, about six million acres of poten-

likely to arise, however, because costs would be prohibitive and political reaction from both farmers and taxpayers would be irresistible. Moreover, such acquisition programs might not achieve long-range agricultural gains. The heart of American agriculture is the independence and individual motivation of millions of landowning farmers. Systems that restrict that independence too much are not famous for their agricultural productivity.[98]

A more realistic approach is for a government to purchase only the development rights to farm property—a "PDR" program. Under the Massachusetts PDR program, for example, the state pays a landowner the difference between the fair market value and the agricultural value of the land in question. In return, the state receives a recordable restriction running with the land that prohibits activities detrimental to agricultural use. The landowner retains all other rights to the property and maintains for agricultural purposes all the benefits (and risks) of independent ownership.[99]

A straight PDR program has many advantages. It is open and above board; because states must appropriate public funds to pay for purchases, the costs are direct and cannot be hidden.[100] In contrast, the costs of some tax reduction or credit programs and the costs of most regulatory schemes are often hidden. In addition, the agricultural land preservation achieved is permanent. Finally, because such programs are voluntary, they can target precisely which land to preserve and ignore land which is unproductive, unlikely to come under much development pressure, or under so much current development pressure that it is too expensive to preserve.

The primary difficulty with PDR programs is the mirror reflection of their strength. Because PDR programs involve voluntary purchases, they are expensive, and the costs are difficult to hide. In areas adjoining cities, the fair market value of agricultural land is often many times its agricultural value. The difference can amount to several thousand dollars per acre. If the state must pay the actual difference, the costs can

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tial cropland, 279 million acres of pasture, and 236 million acres of forested land. NALS REPORT, *supra* note 2, at 6.

98. For example, despite more arable land, more capital investment in agriculture, and nine times more investment of labor in agriculture than the United States, the Soviet Union suffers problems in almost every facet of its agricultural sector. *See* L. BROWN, *supra* note 21. *Cf.* Gondwe, *Agricultural Policy in Tanzania at the Crossroads*, 3 LAND USE POLICY, No. 1, at 31 (1986).

99. *See* Storrow & Winthrop, *Agricultural Land Retention: The Massachusetts' Experience*, 38 J. SOIL & WATER CONSERV. 472 (1983).

100. Such openness is especially preserved if legislatures must vote on annual appropriations. Several PDR programs have succumbed to an inevitable temptation to avoid actual appropriations by instead issuing bonds to cover expenses. *Id.* Bonds, of course, defer most actual payment to a later time when the bonds must be redeemed, so that they effectively disguise present costs. Under current law, the interest on such bonds may be exempt from federal tax. Thus, some costs are not merely hidden but actually passed on to taxpayers in other states. Because of this effect, and because state and local tax-exempt bonds are becoming such popular financing devices that they measurably deplete federal revenues, the whole concept of tax-exempt bonds is now controversial.

become prohibitive. For example, the Massachusetts program has costs of about $1,500 per farmland acre preserved.[101] If the program extended to all the state's farmland, the total cost could approach a billion dollars, assuming no change in future fair market values.[102]

Taxpayers would probably refuse to support costs of this magnitude, especially if the program required an open, annual appropriation. Thus, an explicit PDR program is likely to remain limited in scope. The Massachusetts program, for example, preserves only about 2,300 acres of its farmland (about one-half of one percent) and considerably less cropland per year.[103] Limited programs, however, entail a serious consequence. By definition they leave some farmland "unprotected," and this land promptly becomes the new focus of any (now heightened) development pressure. Thus, although such a program may direct *which* farmland a state preserves, it may have little effect on the overall quantity of farmland preserved.

The cost limitations inherent in the Massachusetts program are applicable elsewhere. State programs have a difficult time obtaining realistic funding.[104] County purchase programs are often similarly constrained.[105] For major farmbelt states, costs could limit such pro-

101. As of November 1985, the program's cost was $1,498 per acre restricted. Letter from Chris Sullivan to author (Nov. 4, 1985) (Mr. Sullivan is a Senior Land Use Planner at The Massachusetts Department of Food and Agriculture). The cost per acre has more than doubled, however, for land which the state is currently purchasing. *Id. See also* MASS. DEP'T FOOD & AGRIC., SAVING FARMLAND IN MASSACHUSETTS: THE AGRICULTURAL PRESERVATION RESTRICTION PROGRAM ANNUAL REPORT, FISCAL YEAR 1984, at 9 [hereinafter cited as SAVING FARMLAND] (showing per acre costs of $1,594).

102. In 1982, Massachusetts had 297,000 acres of cropland, 202,000 acres of pastureland, 370,000 acres of minor land cover uses, and 2,970,000 acres of forest land. *See* 1982 NRI, *supra* note 49, at Table 2a. The Massachusetts PDR program appears to include land in all these categories, although the first two presumably dominate. *See, e.g.*, SAVING FARMLAND, *supra* note 101, at Appendix (describing the "Kulisa acquisition," involving payment for rights to 26 cropland acres and 76 acres of pasture and woods). If Massachusetts acquired all of this rural land at $1500 per acre, the cost would approach six billion dollars. Conversely, the state could preserve all the cropland for about $450 million. Note that the assumption that land market values will remain constant is probably optimistic. If an acquisition program is extensive enough, it will drive up the value of remaining unrestricted properties, thus making them even more expensive to acquire. Of course, enough unrestricted non-cropland may be available to decrease this effect. *See* O. FURUSETH & J. PIERCE, *supra* note 86, at 70.

103. Massachusetts has acquired a total of 13,789 acres in the six years of the program, at a cost of $20,652,000. For the last three years, the program has acquired rights on about 3,300 farmland acres per year. Letter from Chris Sullivan, *supra* note 101.

104. *See, e.g.*, Kaplan, *The Effect of Act 250 on Prime Farmland in Vermont*, 6 VT. L. REV. 467 (1981). A proposed Pennsylvania program would cost $50 million every year. *See* Pa. House Bill 806 (1985). However, the chances for passage in the 1985-86 session appear slim. Telephone interview with John Nikoloff, Pennsylvania Legislative Office (Sept. 10, 1986). Maryland, which claims the national lead in acreage subject to preservation easements, has permanently preserved 37,000 acres, which is about a third of the acreage in agriculture preservation districts. *See* MARYLAND AGRICULTURAL LAND PRESERVATION FOUNDATION, ANNUAL REPORT, FISCAL YEAR 1985 1.

105. *See* O. FURUSETH & J. PIERCE, *supra* note 86, at 60-70. A King County (Seattle) program in Washington has paid as much as $30,000 per acre for bottomland rights. Even at that price, the program has been able to reach only about half of a targeted 6,000 acres. Telephone interview with Kieth Artz, Project Manager (Nov. 1, 1985). Overall, the King County program may preserve about 13,000 acres for a cost approaching $50 million. Suffolk County, on Long Island, all of which

grams to a fraction of potentially developable cropland, significantly reducing the future impact of the programs.[106] Therefore, some proponents of expanded preservation advocate other methods of achieving that goal, including farm use protection, tax reduction, and regulatory programs.

B. Farm Use Protection Programs

Some farmers may sell their land because of frustration with continued farming, and not simply because of the positive attraction of urban land use values. To this extent, preservation programs may meet their goals without paying all the costs entailed in buying development rights. At slight expense, the state could offer farmers some protection for relatively trouble-free agricultural uses. For example, the state can help to preserve farms near high density urban areas by curtailing nuisance suits and directing the public exercise of the right of eminent domain toward land that is unsuitable for farming. Through simple changes in trespass and tort liability laws, the state can mitigate debilitating encounters with residential neighbors who see farm fields as publicly accessible recreational space or who carelessly or deliberately vandalize easy agricultural targets.[107] Several states have enacted farm use protection laws.[108] In some states, such laws are the principal farmland preservation effort; in others, the laws may be part of a broader program.

In most instances, however, farmland conversion is caused more by changing land values than problems associated with continued farming. Farm use protection laws, by themselves, are unlikely to have much impact on overall rates of conversion.[109] More effective programs seem necessary to dampen conversion rates. For many jurisdictions, the centerpiece of the preservation effort is financial inducements in the form of tax reductions costing less than the full purchase of development rights.

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faces development pressure, has paid up to $18,000 per acre. Telephone interview with Dr. Lee Koppelman, Chairperson of Suffolk County Select Committee on Farm Preservation (Oct. 31, 1985). Counties in Massachusetts have contributed to acquisitions under the state program, but only to the extent of about four percent of program costs. *See* SAVING FARMLANDS, *supra* note 101, at 9.

106. According to the NALS Report, the 12 North Central states have about 229 million acres of cropland and 417 million acres of farmland. NALS REPORT, *supra* note 2, at 8. If PDR programs included all this cropland and the cost of permanent development restrictions averaged only about $440 per acre, the total bill would come to $100 billion. If only cropland in Illinois was preserved, at a cost of only $800 per acre, the total cost would be about $20 billion.

107. Farmers are not alone in favoring reduced tort liability to injured recreational users and simplified trespass law. Organizations representing recreational users recently joined with landowners in efforts to get such legislation enacted in every state, hoping to slow a trend among farmers and other rural landowners toward closing off their property behind a line of "no trespass" signs. *See, e.g.*, WIS. STAT. ANN. § 895.52 (West Supp. 1985).

108. *E.g.*, ILL. REV. STAT. ch. 5, § 1001 (1985) protects against nuisance suits, local regulations which unreasonably restrict farm operations, and special assessments for services rendered mostly to others. ILL. REV. STAT. ch. 5, § 1301 (1985) requires government agencies to plan in accordance with agricultural preservation values. *See also* Governor's Exec. Order No. 4, Preservation of Illinois Farmland (1980). *Cf.* WIS. STAT. ANN. § 823.08 (West Supp. 1985).

109. *See, e.g.*, S. REDFIELD, *supra* note 1, at 98.

C. *Tax Reduction Programs*

Various ways exist to reduce the tax burdens on farmers. Most options will likely appeal to everyone affected, except other taxpayers. Most possibilities have been tried somewhere. Perhaps the most modest effort is merely to reduce personal property and *ad valorem* taxes on farm machinery and equipment or to eliminate sales and use taxes on such items.[110] Some jurisdictions also reduce or eliminate special assessments on farmers for the public improvements incidental to expanding metropolitan areas.[111]

Inheritance and estate taxes may also influence decisions to sell farms. Especially in areas subject to conversion pressures, land values may be so high that these taxes can effectively force the sale of a farm, even if the next generation would choose to continue farming if it could afford to do so. Several jurisdictions have accordingly reduced death taxes for agricultural land.[112] Changes in federal income tax provisions could also discourage cropland conversion,[113] and Congress could tie federal support and benefit programs for farmers to preservation obligations.[114]

Most tax reduction programs involve property taxes. As land values rise near expanding urban areas, resulting property tax increases may be the final straw for farmers who struggle to compete with more rural pro-

110. *See id.* at 96.

111. *See, e.g.*, WIS. STAT. ANN. § 91.15 (West Supp. 1985). However, Wisconsin denies to lands which receive the benefit of exemption from special assessments the use of the public improvement in question, unless the landowner pays in an equivalent amount.

112. *See* S. REDFIELD, *supra* note 1, at 96. For most families, however, the federal estate tax has been the dominant levy. Now that Congress has significantly reduced the federal estate tax, death taxes may no longer be such an important factor in farmland conversion. As of 1987, estates of $600,000 or less will be exempt from a federal estate tax. *See* I.R.C. §§ 2001, 2010 (West Supp. 1986). *See also* I.R.C. § 2032A (West Supp. 1986) (providing that under certain conditions, the value of farmland for estate tax purposes shall be its farm use value, not its market value).

113. Given the current federal budget and tax crisis, Congress probably will not affirmatively lower federal revenues to encourage preservation, for example, by granting a special deduction or credit on income taxes in return for a preservation commitment, as some states do. On the other hand, Congress may choose to reduce certain current deductions that encourage hobby farms and thus may contribute to conversion pressure. For example, provisions for accelerated depreciation and immediate deductions for expenses that the taxpayer would normally have to capitalize are likely to benefit those taxpayers with high salaries or other income to shelter more than most working farmers. Such provisions may be ripe for reform because of the public's general frustration with tax shelters. More directly, Congress could reduce deductions and depreciation allowances for all new, non-farm, residential or commercial construction on cropland, thus diverting such development elsewhere.

114. Some states now promote tie-in provisions. For example, Wisconsin conditions admission to its tax reduction program on adherence to soil and water conservation standards. WIS. STAT. ANN. §§ 91.13(8)(d), 92.104 & 92.105 (West Supp. 1985). In the long run, the tie-in provisions may conserve more soil than the land preservation part of the program, which often is only temporary. The possibilities for tying federal tax benefits to preservation are more extensive, because the array of federal benefits is much greater. The recently enacted federal farm bill provides for a conservation reserve program of at least 30 million acres to reduce soil erosion problems. Food Security Act of 1985, Pub. L. No. 99-198, § 1231, 99 Stat. 1354, 1509 (1985). With tens of billions of dollars earmarked for support and set-aside programs, the potential for reducing conversion by conditioning benefits on the assumption of a preservation obligation is, to say the least, considerable.

ducers and who may already be tempted to sell out for the new high land prices. The problem can be doubly difficult because local expenses, particularly for education, may also rise rapidly with an influx of suburban families.[115] A program which reduces taxes on farmland to a level based on its agricultural value focuses its advantages on that land which is under the greatest economic pressure to convert. At least in theory, therefore, such a program should help preserve agricultural land at the urban fringes where the conversion rate is highest. Maryland first enacted property tax reduction programs in 1956, and many states have since enacted similar programs.[116]

A typical program involves a voluntary promise by the landowner to use the land only for agricultural purposes for a fixed period of years. In return the landowner receives a property tax reduction during the period. Under most programs, landowners can breach the agreement if they repay the past reductions granted, plus interest.[117] Some programs prohibit conversion without permission.[118] Because the programs involve long-term commitments, and because the programs reduce public revenues rather than allocate funds already collected, they may have an important advantage: the actual costs incurred are spread indirectly among all other taxpayers. Moreover, the state need not review the program each year as part of a budgetary allocation process. The beneficiaries are more likely to appreciate the real tax impacts than the ultimate payers. Accordingly, tax reduction programs which involve considerable sums may be more acceptable politically than either explicit purchase plans or regulatory restrictions.[119] The result is that the state can extend tax reduction programs to far greater acreages than PDR programs.[120]

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115. In some areas, education expenses account for by far the greatest proportion of property taxes. One possibility is to shift more of the burdens of education onto a state income tax and away from local property taxes. Urban taxpayers with relatively high income and little real property resist such an approach, and the approach may have implications for local control of schools. Nevertheless, many states are trying to shift the tax burden in this way; property tax revenues are declining relative to other sources of revenue throughout most of the nation. Some jurisdictions, meanwhile, base property assessments on the highest agricultural value of the land involved. As a result, the best cropland may bear the highest tax, which increases the impetus to convert it to other uses. *See, e.g.*, ILL. REV. STAT. ch. 120, § 501e (1985) (tying assessed values to soil quality).

116. *See* Nielsen, *Preservation of Maryland Farmland: A Current Assessment*, 8 U. BALT. L. REV. 429, 431-38 (1979). *See generally* S. REDFIELD, *supra* note 1, at 7, 95-97.

117. Rose, *supra* note 4, at 605.

118. *See, e.g.*, WIS. STAT. ANN. § 91.19 (West Supp. 1985); N.Y. AGRIC. & MKTS. LAW §§ 301-05 (McKinney Supp. 1986).

119. Of course, people concerned with democratic accountability and public deficit spending may be less inclined to identify this feature of tax reduction programs as an overall benefit. In addition, one unintended consequence of either property or state income tax reductions may be an increase in federal income taxes, assuming state and local taxes remain deductible for federal purposes.

120. For example, through fiscal year 1984-85, California's Williamson Act property tax reduction program included more than 15 million acres at a cost of nearly $14 million. Letter from S. Oliva, Manager, Land Conservation Unit, Calif. Dept. of Conserv. (Nov. 13, 1985). Under Minnesota's Agricultural Property Tax Relief Program, the amount of land value excluded from the 1983 property tax was over $700,000,000. Interview with Paul Burns, Natural Resources Planning Program Coordinator, Planning Division, Minnesota Dept. Ag. (Nov. 4, 1985). New York's program

Notwithstanding such advantages, however, property tax reduction schemes present several potential problems. A preliminary difficulty might be state constitutional provisions which forbid any distinction among property tax rates for lands of like market value. In most jurisdictions, the courts have construed such provisions to be inapplicable, and in others, constitutional amendments have specifically addressed the point.[121] Judicial tolerance may cease, however, if doubt is cast on the agricultural necessity that underlies the programs or if the programs expand to create two general classes of property taxpayers, rural and urban, who pay at different rates. Another problem could manifest itself if nearly all the property in a rural county came under a tax reduction scheme: as nearly everyone's assessments decreased, the mil rate would have to increase commensurately. This would render the supposed tax savings nugatory, unless either the state absorbed county tax losses, the few areas not included in the program paid extreme taxes, or the county government cut its expenses. The last two possibilities are unlikely to be acceptable in most counties. Thus, only a state-subsidized or state-mandated program should succeed in enrolling most land in rural counties.[122]

A more serious limitation of property tax reduction programs is that their impact may be too modest to have much effect on land that is subject to intense development pressure. Property taxes usually amount to only a fraction of property values, perhaps between one percent and, at the most, four percent of the property's value. Even under formulas that hold assessment rates to agricultural value, depressing the assessment value by as much as three-quarters of the property's actual market value, the actual tax dollars which the landowner would save may pale in comparison to the economic gains that attend conversion to non-agricultural use. Thus, property tax reduction programs may slow conversion but will not stop it. Arguably the programs may even increase conversion, because speculators will offer more for potentially convertible land, knowing that the land will cost little in taxes while they hold it temporarily vacant awaiting suburban development.[123]

One solution to the problem of property tax reduction programs having too little tax impact to significantly affect conversion, as well as the problem of distorting the distribution of local or county tax burdens, is to shift the tax benefit to a state income tax through deductions or credits. A few states have done so and have been able to expand their preservation programs to impressive dimensions.[124] Income tax advan-

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excluded over $500 million in land in 1983. Telephone interview with Mark Twentyman, Agricultural Validation Specialist, New York State Division of Equalization and Assessment (Nov. 1, 1985).

121. *See* S. REDFIELD, *supra* note 1, at 96.

122. For the past three years, legislation has been introduced in New York to reimburse counties for the approximately $16 million in property tax relief extended to farmers. The legislature has failed to pass the legislation. Telephone interview with Mark Twentyman, Agricultural Validation Specialist, N.Y. State Division of Equalization and Assessment (Nov. 1, 1985).

123. *See* S. REDFIELD, *supra* note 1, at 96-97.

124. *See, e.g.*, WIS. STAT. ANN. § 71.09(11) (West Supp. 1985). Wisconsin now has about

tages, however, may benefit wealthy owners more than small farmers struggling to persevere near urban areas and, like property taxes, may be insufficient to stop most conversion.

Thus, as with purchase programs, the primary effect of tax reduction programs may be to direct overall conversion rather than limit it. Unlike purchase programs, however, most tax reduction programs cannot control well the direction of conversion because they rely on the voluntary self-selection of those farmers who choose to be included in the programs. Including marginal cropland, or worse, forest land, grazing land, and open space in the programs dilutes the preservation of prime cropland. However, these other lands seem inevitably eligible for the programs, and combined they add approximately 900 million acres of potential coverage nationwide. Thus, including land other than prime cropland diminishes the chances for a thoroughly comprehensive program. By deterring development in rural areas not used for crops, tax reduction programs may actually encourage conversion of remaining cropland, if the cropland is left unprotected to bear all of the conversion pressure alone.[125]

The biggest problem with many tax reduction programs involves the duration of the preservation agreements exacted as the price of tax reductions. If this article's earlier projections are accurate, there will be no cropland preservation needs for at least a few decades. Most tax reduction programs, however, have preservation agreements which last less than that period of time. Typically, after twenty years, the landowners in question can without penalty opt out of the arrangement and develop the land for residential or other purposes. Some of the agreements last for only eight or ten years.[126] For a cost of many millions of dollars for some states, tax reduction programs will protect some—but not all—rural land from development for precisely the period when current protection is unnecessary and perhaps even damaging to the agricultural economy. Development pressure that is not relieved by expansion into other rural areas should build up over that period. When the temporary protection afforded by the tax reduction program terminates at the end of the contract period, development pressure may be even greater on the

16,700 farms, representing 5.6 million acres, enrolled in its program, at an estimated cost of $28 million in 1985. For fiscal year 1986-87, the program's cost is projected to be about $40 million. This represents an increase of about 2,500 farms in a year. Letter from James Arts, Wisconsin Department of Agriculture, Trade and Consumer Protection (Mar. 24, 1986).

125. If the best cropland is located at the edge of a city, *see supra* note 66, and it is not enrolled in a tax reduction preservation program because its conversion value is too high, the preservation program actually may protect predominantly non-cropland farther from the city. Such a situation decreases the total land available for development and puts still more conversion pressure on the best cropland.

126. Proposals under the New York program may call for a review period of 8, 12, or 20 years. N.Y. AGRIC. & MKTS. LAW § 303 (McKinney Supp. 1984). Wisconsin has a 10 to 25 year period. WIS. STAT. ANN. § 91.13(10) (West Supp. 1985). A landowner, however, may find cancelling an agreement difficult after entering into it, even if local authorities are unopposed. *See* Sierra Club v. City of Hayward, 171 Cal. 619, 623 P.2d 180 (1981).

once-protected land. Of course, the parties might renew the preservation agreement, but, as is true for land nearest the cities, the economic inducements for conversion often would overwhelm the incentive to stay in the program. The high cost of temporary protection may thus provide little of the protection that may be necessary in the future.[127]

D. Regulatory Programs

The limited effectiveness of purchase and tax reduction programs has led a few states and several commentators to conclude that a successful program must have a regulatory component. Some commentators advocate a transfer of development rights program (a "TDR" program). Under such a program, the state compensates a farmer whose land is zoned for agricultural use only by giving the farmer extra development rights in another area in the jurisdiction where other owners are precluded from such development. TDR programs have some value in urban contexts, and in some circumstances have passed constitutional muster there.[128] TDR programs nonetheless remain controversial, and seem less efficacious for across-the-board efforts to control rural development.[129] States have rarely used them in rural areas, and they are unlikely to play a significant future role.[130]

Direct regulatory control is more appealing to many. As one commentator has noted, the likelihood of the continuing inability of programs that remain voluntary or are locally administered to achieve their objectives "demonstrates the need for more integrated government intervention encompassing planning, regulation and incentives to protect agricultural lands."[131] Regulation may take the form of large lot zoning or exclusive agricultural use zoning.[132] Regulatory controls can be as per-

127. Landowners have already withdrawn more than 30% of the acreage under preservation covenants under Minnesota's Metropolitan Agricultural Preserves Act. *See* METROPOLITAN COUNCIL OF THE TWIN CITIES AREA, METROPOLITAN AGRICULTURAL PRESERVES ACT: A 1985 STATUS REPORT, Publication No. 02-85-139, at 7.

128. The leading case involves historic preservation zoning. *See* Penn Cent. Transp. Co. v. New York City, 438 U.S. 104 (1978).

129. In even the limited *Penn Central* circumstances, three Justices dissented. *See Penn Central*, 438 U.S. at 138 (Rehnquist, Stevens, Burger, J.J., dissenting). *See also* Fred F. French Inv. Co. v. New York City, 39 N.Y.2d 587, 350 N.E.2d 381, 385 N.Y.S.2d 5 (1976), *cert. denied*, 429 U.S. 990 (1977). In order to grant realistic compensation to large numbers of agricultural landowners through a TDR program, the state would have to transfer commensurate development rights elsewhere. This transfer could make a mockery of the zoning restrictions otherwise imposed in the receiving area. If the effort is too blatant, courts might see these zoning restrictions as contrived merely to be waived and to appear as compensation for the TDR program. The courts might therefore strike down the zoning restrictions as an unconstitutional taking, not of the burdened agricultural land but rather of the artificially restricted receiving land. Large-scale rural TDR programs thus would raise constitutional questions not obvious in historic preservation cases.

130. *See* S. REDFIELD, *supra* note 1, at 99. Some observers are at least cautiously optimistic about a future role for TDR programs. A countywide TDR program may soon be in place in Loudoun County, Virginia. *See* 14 LAND USE PLANNING REP., No. 4, at 32 (1986).

131. S. REDFIELD, *supra* note 1, at 108.

132. Oregon has the most extensive agricultural use regulatory program, covering 15 million acres, about half of the state's privately owned land. Half of Oregon's land is publicly owned. Tele-

manent as the political institutions that enact and enforce them want them to be. Moreover, regulation need not involve affirmative public payment (except for administrative costs) or indirect tax subsidies. Because it is coercive, regulation may be the program of last resort for cropland preservation; however, at least at first blush, regulation seems to accomplish the job with the most effect and least cost.

Appearances may be misleading, however. Regulatory programs also suffer from serious defects. Some of the costs of regulation are more subtle than the demonstrable dollar costs of purchase and tax reduction programs. The costs may nevertheless be profoundly negative in the long run.

Some economists argue that regulation may offer no more financial savings than direct public payment, and that free market forces would best achieve the goal of preserving cropland. The whole notion of regulation is premised on the idea that someone other than the farmers who own the cropland better knows the real future value of the land. The accumulated wisdom of the farmers who sell their land is that its future agricultural value is less than its value for other uses. This is the force that drives the engine of conversion in the first place. If the farmers are right about future values, displacing their market judgment with that of outside regulators would be economically irrational. Farmers probably *are* better at assessing the future of agriculture than others.[133] The net effect of regulation would be to keep the land in something other than its best economic use, as it would be if it was available in an open market in which all bidders were free to compete for the purchase of the land and to use the land to maximize its income. Thus, the primary effect of regulation of agricultural land sales may be to disrupt both present and future economic conditions. By compelling consumers to accept a surer guarantee of relatively inexpensive food in the future at the cost of paying more now and later for other goods, especially housing,[134] regulation may, in the end, result in a lower standard of living for all concerned.

Regardless of how one views the long-term economic implications of

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phone interview with R. Eber, Oregon Office of Land Conservation and Development (Oct. 25, 1985). Another possibility might be to require an "agricultural lands preservation impact fee" to be paid by developers, much as concessions and payments are now often required under subdivision controls. *See* Juergensmeyer, *Implementing Agricultural Preservation Programs: A Time to Consider Some Radical Approaches?*, 20 GONZAGA L. REV. 701, 713 (1986).

133. Luttrell, *supra* note 53, at 41-42.

134. If a cropland shortage does occur in the future, the foreseeable consequences for Americans will not include nutritional deficiencies, but only food prices that are higher relative to other products. *See supra* notes 89-92 and accompanying text. Just as the United States has a substantial cushion protecting it from possible shortages of food, so too could Americans reduce their standard of housing without suffering intolerable poverty. For example, Americans enjoy about 50% more living space in their homes and apartments than West Europeans, and nearly three times as much space as Soviet citizens. *See* B. STOKES, GLOBAL HOUSING PROSPECTS: THE RESOURCE CONSTRAINTS 15, Table 2 (Worldwatch Paper No. 46, Sept. 1981). If the country must face a future clash between housing and agriculture, it may only involve a reduction in present standards that others perceive as luxurious.

regulation of agricultural land sales, the short-term consequences are easy to identify. To the degree that the state does not compensate the farmers involved, they absorb the loss between the fair market and agricultural values of the land. Both purchase programs and regulatory programs have comparable costs. The difference lies in the distribution of those costs. In purchase programs, the general public bears the cost; in regulatory schemes, the farmers themselves bear the cost. This difference raises a host of difficulties.

Looked at in this light, regulation represents a redistribution of wealth from present farmers, the value of whose land is depressed, to (future) urban residents, who do not have to pay for the greater assurance of inexpensive food. On a large enough scale, such a redistribution of wealth might raise the fear of majoritarian and legislative tyranny that worried the constitutional founders.[135] It might also help create the conditions that seem to lie behind the current agricultural stagnation of many LDCs.[136] Given the present low economic status of farmers in the United States, regulation might further cause a regressive skewing of *per capita* wealth and help ensure a gradual reduction in the number of enthusiastic small farm families.[137]

Few farmers will welcome thoroughgoing regulation, even if tax reductions and other benefits sweeten the pill. Farmers' resistance to regulation may result in another cost to society. Because farmers exert considerable political influence in rural municipalities and counties, local governments will have difficulty enacting local regulatory ordinances which preserve agricultural land by forbidding its lucrative conversion. If local governments enact regulations, local enforcing boards will probably grant easy variances.[138] Thus, for regulation to be effective, more state than local accountability will be necessary.[139] The cost will be a loss in local autonomy—a cost difficult to measure, to be sure, but not a minor element in the American democratic scheme. Farmer opposition also may doom widespread regulation politically at the state level; but if it does not, the consequence will be a shift toward more centralized

135. *See, e.g.*, THE FEDERALIST, No. 51, at 323-34 (J. Madison) (New American Library ed. 1961).

136. Observers widely agree that a major problem in many African countries is that the governments deliberately suppress current food prices to propitiate the urban consumers to whom government leaders are accountable, with the result that farmers lack the incentive to grow more food. *See, e.g.*, L. BROWN & E. WOLF, *supra* note 20, at 63.

137. The *per capita* disposable income of farmers, more than two-thirds of which comes from non-farm sources, is less than 70% of the disposable income of the non-farm population. *See* INCOME AND BALANCE SHEET STATISTICS, *supra* note 4, at 78, Table 54.

138. *See* S. REDFIELD, *supra* note 1, at 102.

139. The Wisconsin program achieves more state accountability by conditioning eligibility for the tax reduction part of the program on the applicant's presence in a county that has adopted "local" regulations that satisfy the state. Such a scheme brings local pressure to bear on rural county boards to enact suitable laws. Of course, enactment and enforcement of laws may be very different things. *See* WIS. STAT. ANN. § 91.31 (West Supp. 1985).

power over land use decisions in state capitals at the expense of local governments and individual farmers.

Farmers, however, would bear only the most obvious costs. Indirectly, urban residents would also suffer a loss. Urban dwellers would lose the ability to purchase relatively inexpensive rural land to accommodate population expansion and rising living standards. The effect would be less if non-cropland rural areas remained available for changing uses. Nevertheless, many urban residents may prefer that farmland preservation schemes, especially ones they pay for with their taxes, not become too extensive in scope.

If urban residents cannot move to the suburbs, metropolitan population densities must increase, unless the nation's population growth ceases. At the same time, rural areas would pay a high economic price in depressed land values.[140] Such a system would not be a disaster—it works well in much of Europe, with its rigid rural preservation rules, compact cities, small houses, and special agricultural needs. Nevertheless, such a system may be unacceptable in the United States.

Zoning regulations, to be sure, are commonplace in the United States. Generally, the courts have upheld zoning regulations as a legitimate exercise of the state's police power, even when the result may substantially deprive landowners of the economic value of their land.[141] Judges are sympathetic to the amenities of suburban living and open space,[142] especially if zoning authorities have taken care to provide for the orderly accommodation of an expanding population,[143] or if dwindling natural resources are in danger.[144] The use of the zoning power to preserve future agricultural resources would sometimes pass judicial muster.[145]

At the same time, however, the courts have expressed concern about some of the negative implications inherent in zoning. Courts have protected the property rights of individual landowners when zoning provisions control the development of their land for the primary benefit of

140. Regulation would preserve a rural way of life. Some rural residents (or seasonal occupants) might well tolerate this regulation, especially those with large neighbors but not much land of their own or with enough other wealth not to care about a diminution in the value of their land.

141. *See, e.g.*, Euclid v. Ambler Realty Co., 272 U.S. 365 (1926). *Euclid* is the leading United States case approving zoning. In *Euclid*, land values decreased by as much as 75%. The Supreme Court has permitted land value reduction as great as 92.5%. *See* Hadacheck v. Sebastian, 239 U.S. 394 (1915) (value reduced from $800,000 to $60,000). Other courts have tolerated even greater reductions. *See, e.g.*, William C. Haas & Co. v. City and County of San Francisco, 605 F.2d 1117 (9th Cir. 1979), *cert. denied*, 445 U.S. 928 (1980) (involving a 95% loss of value).

142. *See, e.g.*, Village of Belle Terre v. Boraas, 416 U.S. 1 (1974).

143. *See, e.g.*, Construction Indus. Ass'n v. City of Petaluma, 522 F.2d 897 (9th Cir. 1975).

144. *See, e.g.*, Just v. Marinette County, 56 Wis. 2d 7, 201 N.W.2d 761 (1972); Claridge v. New Hampshire Wetlands Bd., 485 A.2d 287 (N.H. 1984) (both expressly recognizing a critical need to preserve existing wetlands).

145. Courts have upheld some agricultural preservation zoning for decades. *See, e.g.*, Mang v. County of Santa Barbara, 182 Cal. App. 2d 93, 5 Cal. Rptr. 724 (1960); Boundary Drive Assocs. v. Shrewsbury Township Bd. of Supervisors, 491 A.2d 86 (Pa. 1985).

adjacent or nearby neighbors.[146] Courts have also been sensitive to the rights of potential buyers of land kept off the market by restrictive zoning provisions. Courts have been particularly sensitive when restrictive zoning provisions have effectively zoned burgeoning poor and minority populations into squalid urban ghettos, while suburban and rural residents preserve their serene quality of life.[147] Such concern is likely to increase if the cost of residential housing continues to rise beyond the means of most American families, in part because of rising residential land prices.[148] And concern can also only increase if zoning renders large areas of rural property unavailable for occupancy by most of the population,[149] especially if this affects the movement of people across state lines.[150] All of these consequences could ensue if whole areas of the country enact agricultural preservation zoning.

At some point, the courts may intervene to curtail zoning regulations which have such far-reaching negative impacts. Any challenges to such regulations would probably question the police power basis of the regulations and focus on the property rights of the rural owners of the restricted land, although the rights of those persons precluded from moving to the land would also be implicated. The courts may find that such zoning qualifies as an "inverse condemnation" of the agricultural land. The courts may then either simply nullify the zoning or require the state to compensate the affected landowners for the diminished value of their property. The more extensive a farmland preservation zoning program and the more uncertain the agricultural emergency that underlies it (especially if the emergency refers to foods easily purchased from outside the jurisdiction in question),[151] the more likely the program will consti-

146. *See, e.g.*, Valkanet v. City of Chicago, 13 Ill. 2d 268, 148 N.E.2d 767 (1985); Vernon Park Realty, Inc. v. City of Mt. Vernon, 307 N.Y. 493, 121 N.E.2d 517 (1954). Such cases also may involve difficult issues addressing the limits of legislative delegation. *See, e.g.*, City of Eastlake v. Forest City Enter., Inc., 426 U.S. 668 (1976); James v. Valtierra, 402 U.S. 137 (1971); Thomas Cusack Co. v. City of Chicago, 242 U.S. 526 (1917).

147. *Compare, e.g.*, Village of Arlington Heights v. Metropoliton Hous. Dev. Corp., 429 U.S. 252 (1977) *with* Southern Burlington County NAACP v. Township of Mt. Laurel, 67 N.J. 151, 336 A.2d 713, *appeal dismissed, cert. denied*, 423 U.S. 808 (1975). *See also* National Land & Inv. Co. v. Kohn, 419 Pa. 504, 215 A.2d 597 (1965).

148. The current price of an average, new, single family home in the United States is approximately $100,000. *See* HOUSING & DEV. REP., Mar. 11, 1985, at 815. This puts a new house beyond the reach of much of the young population. The cost of land as a component of housing in America rose from 11% in 1949 to 23% in 1980. *See* B. STOKES, *supra* note 134, at 20, Table 4.

149. In Hawaii Housing Auth. v. Midkiff, 104 S. Ct. 2321 (1984), the United States Supreme Court approved a state plan to break up large private estates, including properties held in trust for charitable purposes and some agricultural land, to make the land available for residential ownership. *Midkiff* seems to stand more for recognition of a need for widely dispersed, private, residential development than for unconstrained public power over land.

150. "The constitutional right to travel from one state to another . . . occupies a position fundamental to the concept of our Federal Union." United States v. Guest, 383 U.S. 745, 757 (1966); *see also* Memorial Hosp. v. Maricopa County, 415 U.S. 250 (1974); Shapiro v. Thompson, 394 U.S. 618 (1969).

151. A standard preamble to many state and even local farmland preservation laws is that the particular jurisdiction needs to protect its agricultural future because its own residents may later need the food produced. This justification is not a very persuasive point in a national economic

tute an inverse condemnation.

The issue of inverse condemnation is a current controversy. Most people would agree that the government *can* so severely regulate land that it becomes "taken" under the Constitution.[152] Nevertheless, if no paper title passes, no actual physical invasion of the property occurs, the owner's investment expectations are not *too* impaired, and some reasonable use of the property remains for the owner, the courts will hesitate to apply the doctrine.[153] A few courts do seem relatively eager to embrace inverse condemnation;[154] most courts are more cautious.[155] Courts must examine each case on its facts because a general rule applicable to inverse condemnation has not yet been articulated.[156] The United States Supreme Court has seemed ready to re-enter the debate at least four times in recent years, but the Court has yet to reach an actual decision on the key substantive points.[157] At some point, however, the Court will almost certainly have to address the merits of inverse condemnation. Whichever way it comes out on the question,[158] the broader agricultural issues are sure to remain controversial. The continuing inverse condemnation controversy reveals yet another problem with regulatory schemes:

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union, such as that contemplated by the interstate commerce clause of the United States Constitution. U.S. CONST. art. I, § 8, ¶ 3. It is not at all clear that one state can opt for an agricultural character, while others must cope with population expansion, if other states could grow the nation's food. *See, e.g.*, Philadelphia v. New Jersey, 437 U.S. 617 (1978). *Cf.* Beck v. Town of Raymond, 118 N.H. 793, 394 A.2d 847 (1978).

152. *See, e.g.*, Pennsylvania Coal Co. v. Mahon, 260 U.S. 393 (1922).

153. *See* Penn Cent. Transp. Co. v. New York City, 438 U.S. 104, 123-30 (1978).

154. *See, e.g.*, Zinn v. State, 112 Wis. 2d 417, 334 N.W.2d 67 (1983); Note, *Inverse Liability of the State*, 1984 WIS. L. REV. 1431. *Cf.* Grand Land Co. v. Town of Bethlehem, 196 N.J. Super. 547, 483 A.2d 818 (1984) (striking down a zoning regulation requiring a subdivider to reserve part of the land in question for agricultural use as a condition for being allowed to develop the rest).

155. *See, e.g.*, Kinzli v. City of Santa Cruz, 620 F. Supp. 609 (N.D. Cal. 1985).

156. "[The] Court, quite simply, has been unable to develop any 'set formula' for determining when 'justice and fairness' require that economic injuries caused by public action be compensated by the government, rather than remain disproportionately concentrated on a few persons." Penn Cent. Transp. Co. v. New York City, 438 U.S. 104, 124 (1978) (referring to Goldblatt v. Hempstead, 369 U.S. 590, 594 (1962)).

157. *See* MacDonald, Sommer & Frates v. Yolo County, 54 U.S.L.W. 4782 (1986); Williamson County Regional Planning Comm'n v. Hamilton Bank of Johnson City, 105 S. Ct. 3108 (1985); San Diego Gas & Elec. Co. v. City of San Diego, 450 U.S. 621 (1981); Agins v. City of Tiburon, 447 U.S. 255 (1980).

158. In all four of the cases noted above, the Supreme Court concluded that further administrative or judicial proceedings were needed to determine whether the zoning restrictions in question were extensive enough to invoke constitutional sanction under the doctrine of inverse condemnation. However, separate opinions filed in two of the cases suggest that if the issue ever is unavoidably presented, the Court may recognize and apply the doctrine. In *San Diego Gas & Elec. Co.*, five Justices wrote in favor of recognition and potential application of the doctrine. 450 U.S. at 646-61 (Brennan, Marshall, Powell & Stewart, J.J., dissenting); *id.* at 633-34 (Rehnquist, J., concurring procedurally, but agreeing substantively with the dissent). In *MacDonald, Sommer & Frates*, Justice White dissented, joined by Burger, Powell & Rehnquist, and called for recognition of the doctrine. 54 U.S.L.W. at 4787-88 (White, Burger, Powell & Rehnquist, J.J., dissenting). Thus on the substantive merits of the issue, as opposed to deciding when the issue has been properly presented, seven of the nine Justices (six of the eight Justices likely to remain on the Court for its next term) have expressed views in favor of recognition and application of the doctrine of inverse condemnation. The unanswered questions, of course, are when the Court may finally decide the matter and what *degree* of zoning restriction on agricultural land will be tolerated.

if such efforts become widespread enough to have a real effect on preservation, they may face an uncertain future in the courts, as well as in legislatures and enforcing agencies.

IV. Future Preservation Programs

The doubt surrounding future agricultural needs and the high stakes at issue allow two safe predictions about farmland preservation programs: they are likely to remain a high priority in many jurisdictions, and they are unlikely to be pursued with such vigor that they actually eliminate conversion. Unless the data on future farmland needs drastically changes or becomes much clearer, the controversy surrounding farmland preservation should persist, ensuring that preservation programs, but only limited programs, continue. The recognition that preservation programs will remain limited in scope has important implications for the optimal design of those programs.

First, when preservation programs are anything less than complete in their scope, they must have a greater impact in controlling the direction than the quantity of conversion. Even the NALS Report suggests that only about one-eighth of one percent of all cropland is converted annually.[159] Restrictions on conversion that apply, for example, to half of all cropland will only tend to divert conversion to the other half. If the rate of conversion in percentage terms is as low as the NALS Report suggests, centuries would pass before that other half was consumed.

Therefore, preservation programs should undertake only to guide conversion, not to stop it. The immediate step for most jurisdictions should be to identify the farmland on which to concentrate their preservation efforts, county by county, farm by farm, even field by field.[160] Unless states and local governments systematically undertake such arduous, time-consuming studies, preservation programs, especially generalized ones like tax-reduction schemes and regulatory controls, will inevitably protect farmland and rural land that is either not vital or at least not as vital as other unprotected cropland. If the purpose of preservation programs is to guarantee future food supplies, then protecting hundreds of millions of acres of rural land that will never be used for anything but non-intensive agricultural purposes, or that will serve primarily as an open space reserve, makes little sense. Rather, the limited financial re-

159. The NALS Report based its calculation on the amount of cropland converted on an annual conversion rate of 675,000 acres from a base of 540 million acres. NALS Report, *supra* note 2, at 7, 13.

160. Several programs now call for such an effort. *See, e.g.*, Wis. Stat. Ann. §§ 91.05, 91.55 (West Supp. 1985). Iowa has recently completed a thorough survey of every county in the state. State-wide results have not yet been released. Telephone interview with Jim Gulliford, Iowa Dept. of Agriculture (Nov. 11, 1985). At the federal level, the SCS has promulgated a Land Evaluation and Site Assessment (LESA) system to facilitate the process, and many local and state agencies have found the LESA system useful. LESA places twice as much value on site assessment, involving such questions as zoning, as it does on land evaluation, involving such matters as soil quality. *See* Wright, Fitzmann, Young & Googins, *LESA*, 38 J. Soil & Water Conserv., Mar.-Apr. 1983, at 82.

sources available for preservation programs should be applied to vulnerable cropland with the highest future potential.[161]

Second, offering cropland protection for only a temporary period, as nearly all of the existing tax reduction programs do, is a serious mistake. To protect a farm from conversion for the next ten or twenty years effectively diverts conversion pressures to other rural land, but only for that period of time. If the farm is susceptible to conversion pressures now, it likely will be subject to even greater pressure at the end of the protection period when it re-enters the market. If the owner converts the land later in response to increased pressure, little gain will result from the costs of temporary protection. Current agricultural production would have been promoted by keeping the farm going (although not by much if other cropland is converted instead). However, current production is already too high, and expensive, contervailing efforts are being taken to *reduce* the nation's land under cultivation. Just when the addition of the cropland in question might be useful because of food shortages, new agreements and new, larger payments would be necessary to keep the land in agriculture. Payment only for permanent protection, albeit on fewer acres, would certainly be a more efficient allocation of preservation expenditures.

Third, protection should be focused on areas that are *not* now under the most intense conversion pressure. Fields nearest the expanding cities are likely to be lost to non-agricultural use anyway, especially if the land is subject only to temporary protection. The tens of millions of new people expected in the next few decades must live and work somewhere. As metropolitan areas expand, the pressure on the nearest farms can only increase, and even under the most stringent regulatory programs, these lands are likely ultimately to be converted.[162] Thus, programs which concentrate on areas of greatest current conversion pressure (and hence, areas which are the most expensive to preserve) will be forced to spend more resources per acre for protection that may well be futile in the future—which is the only time, if ever, the protection will be necessary. A better approach would be to anticipate which farms are likely to come under pressure in two or three decades, and to focus attention on them. For lower costs per acre, productive fields could gain permanent protection. The result would be more timely protection at less current cost.

A final implication is that regulatory programs may currently have only a limited role in the overall preservation effort. Because the costs of

161. National resources may be necessary to help pay for the preservation of some unique cropland, such as citrus groves in Florida. *See supra* note 68.

162. Under a regulatory program, such conversion would occur through a process of variances and redefinitions of "agricultural land," or through complete legislative overhaul in the face of the political pressure inherent in a democratic society. Even if the public owned the development rights to the land, pressure would still exist to sell the land and relieve urban congestion. Such pressure now bears on federal and state ownership of large tracts of land (mostly non-cropland) in the western states.

regulatory programs are often hidden and reflect a political redistribution of economic wealth, they can sometimes entail more insidious consequences than open purchase expenditures. Furthermore, regulations almost inevitably sweep with a very broad brush. If efficiency requires that governments tailor protection to fit individual farms and fields, sometimes in areas not immediately adjacent to cities, then exclusive agricultural district zoning may be too clumsy to deal with the problem. Programs that induce voluntary compliance by paying for it can condition participation on whatever qualifications are suitable. To so limit mandatory programs is much more difficult.[163] The result is that most regulatory programs are unlikely to achieve great particularity of application; hence, regulatory programs will not be as efficient as voluntary ones.

Set against these standards, many of the current preservation programs are not succeeding. They have often generated great interest and enthusiasm and have gained significant public financial support. The programs may not be slowing conversion so much as directing it, however, and then only for a temporary period during which protection will be agriculturally superfluous. Often the programs protect individual fields and rural areas that for various reasons will not add much to actual food production in future decades.

If an agricultural emergency does burst upon the nation in the future, the theoretical justification and the political will for universal farmland preservation may allow for programs of such widespread application that they significantly slow or even reverse the absolute rate of conversion. Until then, however, the most efficient programs seem to be those that first acknowledge that their primary role is to direct rather than to eliminate cropland conversion and then proceed to select land carefully on a limited, voluntary basis from among all the farms and fields eligible for protection.

V. CONCLUSION

The question of whether and how to preserve American farmland to help feed a hungry world seems certain to remain controversial. The issues are undeniably important, and the costs of mistakes will be high. Unfortunately, the many long-range projections that are necessary for a rational estimate of future food needs are uncertain and speculative. There is enough room for doubt to make all cautious observers nervous. In such a context, it is imperative that projections of actual needs not be ignored simply because they are so difficult to assert with confidence. The costs of either mindless inaction or mindless over-action can be

163. Theoretically, regulatory programs could achieve precise specificity; historic preservation programs do accomplish this, for example. However, a comprehensive cropland preservation regulatory program is more unlikely to proceed successfully through the political process on a field-by-field basis because the number of landowners adversely affected would be much greater.

equally severe. Perhaps the most important point to make in conclusion may be that the farmland preservation issue certainly deserves more careful and dispassionate study than it often receives.

Current data and moderate guesses about future needs seem to justify concern and at least modest efforts now to address cropland conversion problems. However, available information does not suggest that a crisis is imminent, especially if America takes even cautious steps to avert it. Massive new programs, involving either great public expense or wholesale regulation of rural landowners, are not yet necessary.[164]

Preservation programs, of course, may have other goals than future food needs. The programs may attempt to preserve the way of life of individual, small farmers by reducing their tax burdens.[165] The purpose of the programs may be to maintain open space for the benefit of existing suburban and second home owners or others who want to keep the countryside, or at least their neighborhood, as free from further development as possible. These are understandable goals which should be reflected in a democratic system. They may not be enough by themselves, however, to justify widespread and expensive preservation programs. Advocates of most farmland preservation programs do not openly promote the programs on the basis of such non-agricultural needs, which causes some observers to be suspicious about the real motives involved.[166] Suspicions will deepen if the programs shift from voluntary participation to regulation or expand to affect more seriously the rural land market.

The dictates of prudence and political and financial constraints are likely to limit purchase and tax reduction programs. The Supreme Court may ultimately be forced to become more involved in the controversy on the merits of regulatory programs, especially those programs that severely restrict land use on the basis of asserted, but not thoroughly established, agricultural needs. If so, interest in the preservation issue will probably increase. It is to be hoped that analysis of all the data, projections and estimates, and of the real implications of the various alternative preservation programs will keep pace with rising interest in the farmland conversion problem.

164. In this respect, farmland preservation issues are distinct from soil erosion problems. The latter are potentially much more serious and may be amenable to reduction at much lower costs. *See* Arts & Church, *supra* note 55, at 563.

165. *See* Wadley, *A View of Farmland Preservation From a Different Perspective*, 20 GONZAGA L. REV. 683 (1986).

166. *See, e.g.*, Fischel, *supra* note 79, at 92-94. The conflict between agricultural and environmental interests may become more overt in the future. *See, e.g.*, Brotherton, *Agricultural and Afforestation Controls, Conservation and Ideology*, 3 LAND USE POLICY, No. 1, at 21 (1986).