PRESERVATION of the NATION'S HEARTLAND: PAST,PRESENT,FUTURE

I was honored by your invitation,in January,1985,to present this first"White Memorial Lectureship". The purpose of the lectureship,recently established at the Ontario Agricultural College,University of Guelph, is to highlight technological innovations and new perspectives on controversial issues related to the use of agricultural land resources.It is also gratifying that the lectureship is being funded primarily by the Ontario Federation of Agriculture,an association of farmers. As one who has spent a lifetime of service in,and for Agriculture,at home and abroad,I am allied with my country's largest industry.Its assets of over $1 trillion are equal to 70 percent of the total of all manufacturing corporations of the U.S.A. Some 22 million people (one-fifth of total employment) work in some phase of agriculture,from growing food and fiber,to selling it at the supermarket or the export market. The number of such workers equals the combined total for transportation,the steel industry, and the automobile industry in the U.S.A.

For the benefit of all-the farmer,the consumer,industry and labor-the importance of Agriculture to our society and to our economy-must be continually recognized and perpetuated.As the future unfolds how can we best ensure that a food and fiber production system will be one that is sustainable over the long-term?As one issue,those in government must ever be aware that it is absolutely essential to maintain a strong and coordinated conservation effort.They must realize that the best investment they can help make for the future of a Nation is the conservation of the real wealth-the soil,the water and the timber.With resources that assure a sustainable Agriculture,present generations can feed themselves and pass along to their children the means to prosper during their lifetime.With worn-out land and depleted water supplies,their decendants cannot survive,despite all else.A review of history reveals what happened to those past civilizations of the world which failed to take care of their once fertile lands,timber,and water supplies.

In 1935,when I was a farm boy in Northern Minnesota, most of the 6 million farms were self-sufficient,and farming for 25 percent of the U.S. population,was a way of life.The system was under severe economic stress along with serious water and wind soil erosion that resulted in gullies and the *Dust Bowl.* In 1985,many of the 2.3 million farms,with only 3 percent of the U.S.population,consider Agriculture primarily as a business.However,that sector of our economy again faces stress,with low commodity prices and continuing soil erosion from water and wind.This,despite deep involvement of government in both problems for fifty years.

Soil Conservation Policies-Successes and Failures in the U.S.

Soil is one of the most important natural resources of any people;yet the United States was almost 160 years old before national legislative action was taken to protect it.Many U.S. people thought,even in the 1930's and later,that the American continent was without resource limits.But there always were, and still are,physical conditions that dictate soil and land use capability,in our Nation and every other.

*

Soil and water conservation was declared a national policy on farm,grazing and forest lands of the U.S. on April 27,1935.On that day President Franklin D. Roosevelt signed P.L.74-46,the Soil Conservation Act of 1935.It had passed Congress without a single dissenting vote.

That same day,Secretary of Agriculture Henry A. Wallace created the Soil Conservation Service(SCS) as a USDA agency. He was able to act so quickly because a temporary agency,the Soil Erosion Service(SES) was already at work,formed in 1933 to do erosion control work as one way of relieving massive unemployment.The U.S.economy,including agriculture,was in the midst of a severe depression and the "Dust Bowl"was growing.

SES had been in the Department of the Interior,under Harold Ickes,but was transferred to U.S.D.A. by the President on March 25,1935(a day that Ickes,who was in opposition to the transfer,was reported to be out of town).Secretary Wallace

simply directed that the SES become the SCS,and that Dr.Hugh Hammond Bennett remain as Chief(1935-1951).

These events of over a half century ago marked a recognition that conservation of the physical integrity of the soil is a responsibility of the Nation,as well as of individual farmers,ranchers,foresters,and other landowners and land users.This concept still prevails,but the rationale for continued public spending in this area is being tested as never before.The federal deficit is but one of the reasons. Policymakers must give more attention to the <u>why</u> of conservation policy,to formulate defensible positions on this issue.Public spending,especially at the federal level cannot and should not be taken for granted.I'll discuss this challenge later in my presentation.

I note that the Prairie Farm Rehabilitation Administration (PFRA) was also established in Canada in 1935,to deal with the drought and soil erosion problems in the prairie regions.

The earliest efforts of the SCS to set up demonstration projects and curb some of the most serious erosion were greatly aided by the Civilian Conservation Corps (CCC), another activity aimed at unemployment relief through public service.There were thousands of CCC youth enrolled, working on SCS conservation projects on private lands.Many measures for soil loss reduction received their first test. In February 1937,President Roosevelt sent to the Governors of

all states a "Standard Soil Conservation Districts Law" and urged its adoption.The model law provided the opportunity for landowners and operators to organize and govern soil conservation districts as local subdivisions of state government.They were chartered with authorities and responsibilities to plan and carry out soil and water conservation programs.They were to secure assistance from public agencies,based on memos of understanding.

Literally thousands of agencies,private organizations, business firms,and institutions have contributed to the success of soil and water conservation programs,as full partners with the SCS and the people who own and manage the land,over the last fifty years.The progress in soil conservation has been substantial,athough problems persist.

Today,the U.S.A.still suffers some very serious soil erosion and water conservation problems.We have been successful in several areas,but we have had our share of failures.I will relate the successful policies first.Then I'll identify some of the weak areas.I will also attempt to point out what is planned to help correct past mistakes and to improve the soil and water conservation programs for the future,in the U.S.A.

<u>Soil Conservation Policies that have been Successful in U.S.</u>

-In the early 1900's,recognition of the need for an inventory of soils led to the establishment of the"cooperative soil

survey",by the U.S.Department of Agriculture and the State Agricultural Experiment Stations in each of the States and the U.S.Territories.These surveys initiated the process of documenting in detail the wide variation in soils.This data demonstrates that to maintain the productivity capacity of agricultural land requires using land "within its capability and treating it according to its needs".Approximately 80% of the cropland now has adequate soil surveys and new surveys are completed at a rate of about 40 million acres each year.

-In 1914,F.E.Duley and M.F.Miller,with the College of Agriculture at the University of Missouri,established the first experiment to measure the effect of factors affecting runoff and erosion.

-Based on 1929 authorization,U.S.D.A.established 10 soil erosion experiment stations(in 1930)in diffferent regions of the U.S. where soil erosion was a serious problem.

-In 1934 reconnaisance soil erosion surveys were made of all states.This took two months(a windshield Survey) and helped define soil erosion as a "national menace".

-From the beginning of on-site assistance to the landusers, a conservation farm plan,based on detailed soil surveys, was developed by SCS technicians for use by the farmers.
-Deciding on measures to adopt and the schedule for applying the needed conservation practices has always been the land-

users responsibility.Financial assistance(cost-sharing or credit) has been used as an incentive to help share the cost of establishing certain conservation practices.

-A multidiscipline team was used to develop the practices recommended in the conservation plan.The specifications for each practice was also formulated as the "Technical Guide", for guidance of the on-site work of the conservationist.

-Without a doubt,in the decade of the 1930's,the U.S.soil conservation movement was tied into the performance and lifestream of the SCS and,starting in 1937,was also vested with the soil conservation districts in each state.

-The eventual acceptance that well coordinated research, extension(information),financial(credit and cost-share), and technical assistance programs,were public responsibilities,was an important policy determination.Increasingly the basic policy question is what do non-farmers get for the public investment in soil conservation?The easy answer is that we must get <u>something</u>,or the 96 percent of the U.S. population who do not farm,would not have supported the millions of public dollars appropriated for conservation. Soil conservation programs were established in a time of crisis,in the 1930's.However,in times of commodity surplus, declining farm incomes because of overproduction,and no high profile "dust bowls",the crisis is less clear.Clearly off-site damage to soil and water,resulting from agri-

cultural production,is now giving the clearest evidence that public investments and action is needed to protect those who are damaged by soil erosion,but not involved in the activity that caused the problem.This,of course,introduces the role of the landowner,who always makes the major investment in a resource management system.If all,or most of the benefits go to others,why should the landowner practice stewardship? Important to the context for future soil and water conservation policies and actions is the degree to which non-farmers ,and many farmers will <u>demand</u> that soil erosion be controlled.There are those who argue that the most subsidized industry in the U.S. should be held to stricter standards of environmental protection.Others,including many farmers,ranchers and foresters,feel it is ethical to expect that those who use the land for their livelihood, not ruin it for the future,not to destroy what has taken centuries to create.Society,because of"quality of life" issues ,may move towards the view that agriculture has an <u>obligation</u> to adopt soil conserving practices.

-The voluntary approach of using the carrot instead of the stick,with the landusers has had a long history.The various incentives provided by government,has attracted a large number of landowners to cooperate with their local conservation district.This concept has worked well in many areas. A more compelling approach to soil conservation is beginning to emerge in several forms.The most straightforward would be through regulation.Several states have varying degrees of

mandating that soil loss will not damage others and /or the landuser be implementing soil conserving measures to achieve certain tolerance("T")levels by some future date.Illinois has a concept and system to reach "T by 2000",as one example.

A softer approach includes an array of cross compliance steps that relate conservation to other policies and programs.The recent Food Security Act of 1985 has several features that I'll discuss later.Conservation compliance will not stop soil erosion.Its success will depend on how erosion is distributed compared to distribution of participation in the complying program.It will also depend on how the additional costs of participation for the landuser compare with the benefits of the program that could be denied ,if he chooses not to fully comply.The impact of such shifting of responsibility to the landuser must be considered.Any rule that creates greater obligation for farmers could cause higher costs for someone.

-Establishment of a National Resources Inventory process was important to policy decisions.The U.S.D.A.1977 and 1982 NRI data is now being updated by the 1987 NRI.Field work is now underway and will take about a year.Prior to these recent, highly credible assessments of resource conditions and trends,the U.S.D.A. had only two Conservation Needs Studies. These were not adequate for the changing conditions faced by those who work in Agriculture.The 1977 Resources Conser- Act(RCA),finally provided the authority needed for a more scientific and comprehensive soil and water inventory.

the need to improve the condition of the rangelands and native grasses,improve domestic grasses and legumes for use in rotations,or for hay or pasture,and to improve the forested regions of the Nation.The condition of wildlife habitat is increasingly a problem.Water management includes helping on measures where there is too little moisture (irrigation) or too much (flooding).The land effected by salinization increases each year.Preserving wetlands is a major concern of those who support ecosystems. The non-point source pollution problems have introduced a large workload for soil and water conservationists.There are activities to lessen the off-site damage that could be caused by animal wastes,salinity,nutrients,pesticides and sediment(including that caused by urbanizing of rural areas).How land is used,including efforts to retain most important farmlands and unique areas for special crops,is a fairly recent issue that many states and local units of government are seeking answers for,on a priority basis.

Failures or weaknesses of U.S.soil conservation policies

Recent inventories (1977 and 1982) show that nearly half of all cropland erodes at rates above the tolerance level,and of that land,an area of nearly 100 million acres exceeds the "T" rate by a factor of two or more.This would be at least ten tons per acre per year of soil loss,if a "T" of 5t/a/yr. were considered as acceptable.Moreover,the U.S.D.A.'s traditional conservation programs seem particularly ill-

suited to deal with erosion-prone croplands.The most highly erodible cropland usually requires conversion to a less intensive use,grass,trees and /or wildlife cover,to deal with the soil erosion problem.This concept requires that conservation policy be linked with other policies to be effective.Commodity programs and export promotion have long been identified by soil conservation researchers and farmers as actually discouraging soil conservation.It was not intentional ,but several U.S.D.A."farm programs" created many incentives to use land that resulted in a high soil loss.

Agricultural activities have long been recognized as having a major impact on wildlife. For a variety of reasons,agricultural land use patterns have become less hospitable to wildlife since World War II.This is particularly true in the grain producing regions of the Great Plains and the Midwest, where agriculture has evolved from a mixed crop and livestock operation to a specialized and very intensive production of wheat,corn,sorghums,and soybeans,even mono-culture.

There have been more good solutions to soil conservation problems,more technology available then at any time in history, but it is not being fully utilized.Why is this a problem?

Conservationists have long sought the ultimate technology for protecting the land from soil erosion.Of late,however many professionals have come to realize that government policies, the way in which programs are implemented,and human behavior are often as important as technology.More emphasis is being given to policy development and the implementation of conservation programs as a result.Another way of looking at this issue is to admit that technology is a necessary condition for conserving soil,but not a sufficient condition.More people now recognize the importance of having access to information,the role of institutions,and the barriers to the wise use of soiland water resources.Social scientists,responding to this recognition,have initiated research on many of the behaviorial aspects of soil conservation.

SOIL AT RISK-Canada's Eroding Future-A report on Soil Conservation-by the Standing Committee on Agriculture,Fisheries,and Forestry,to the Senate of Canada;the Hon.H.O.Sparrow,Chairman had many relevant and excellent points.One that relates to the point I have just made is as follows:" the Committee was told that conservation requires a different approach on every farm.Individual farmers would be more likely to engage in new practices if they had access to the right information and technical expertise.But without the qualified personnel to help the farmer overcome the transition from traditional(and) often successful)farming methods to conservation practices, the movement to conservation would be much slower.While basic research is an important element in soil conservation,

witnesses also cited a need for its practical application at the farm level".A vast amount of information is available.One difficulty is that there is no systematic approach---information transfer tends to be haphazard,the report said.

We have found,even as recently as during the bidding process to enter the Conservation Reserve Program (CRP) in 1986,that some landusers have the erroneous impression that their land would not qualify as being "highly erodible".They have not fully appreciated the degree of soil loss that is taking place from sheet,rill and/or wind erosion each year.In many cases the soil loss exceeds the "T" level by a factor of 3 or more from their cropland annually.However,they do not see large gullies or dust bowl conditions,and feel they have no soil loss problem.

There has been a preoccupation with increased productivity. Research and industry,with encouragement from Government, has pushed annual yields higher and higher,without,in too many cases,sufficient regard for the impact on the resource base.Existing policies,not necessarily directed at soils,can have the effect of discouraging good soil management.Soil conservation cannot be dealt with in isolation from related issues such as land use,water quality,wildlife habitat, forestry and agricultural productivity.There have been too few concerned about the continual regeneration of America's food producing capability.This is beginning to change. The integration of conservation with agriculture,in all

possible ways,will require developing a national strategy for long-term food security that peers beyond the immediate future and local interests.

In recent years there has been an increase in audits and oversight hearings to further pinpoint what works and what doesn't work in U.S.soil conservation programs.One finding is that significant effort and funding for current programs are directed at cropland that erodes at less than 5 tons per acre per year.Yet,the benefits of erosion control measures exceed the costs involved only on eroding at about 15 tons per acre per year and above.More benefits from reducing soil erosion are offsite,realized away from the land itself, indicating the significance of public benefits from soil conservation efforts.There is strong evidence to support several areas of public effort that should be strenghtened:

- Improvements in the data base and analytic procedures for evaluating conservation programs
- Continuing efforts,begun in 1981,to target program activities to areas where benefit-cost ratios are the highest
- increasing recognition of offsite damage reduction as a major benefit of U.S.D.A.soil conservation programs
- modifying the conservation program delivery system to target financial and technical assistance to the highly erodible land

A frustrating weakness has been the lack of research on the long-term impact of soil erosion on the inherent productivity of soil.The technolgy that has increased yields has also masked the effect of soil loss.

The conservation planning process has produced over 2 million farmer,rancher,forester resource management plans.However,the followup with the individual landusers,to provide on-site help for implementation has been weak.As a result,many of the cooperators do not have updated plans.The government has,in too many cases,promised more then it can deliver.Expectations of assistance were inflated beyond the abilty to deliver.This relates to the need for targeting assistance,for it will always be limited.

The economic stress in agriculture is,without question,of concern to farmers and conservationists alike.However,I have experienced the good times and the bad times-and conservation has been neglected in both scenarios.Canadian and U.S.farmers are being pushed and pulled in many directions.They do face input costs that are higher,but their equity is falling.The reality is that conservation is not cheap,nor is it a short-term undertaking.Is,as we hear in the U.S.a "cheap food policy" a major roadblock to wise land use and conservation? Does conservation pay,as some say,or is it only stewardship?

What is Planned to Improve Soil Conservation Policy?

The future of soil conservation in the U.S. is first and foremost linked to the future of Agriculture.What will be the long-term capability of our agricultural resources to produce food and fiber? As a society,our welfare depends on the ability of our natural resources to sustain us,our children,our grandchildren,with the basic necessities of life: food,shelter,and clothing.In the past,despite some rocky periods of history,our abundant natural resources have served us well in time of drougth,depression,war,and an expanding population.We continue to utilize resources in fixed supply-minerals,petroleum,soil-and the slowly renewing resources-timber,range,pasture-at ever increasing rates.Our population and the world's,continue to grow,exerting more pressure and even more stress on the natural resources base.

The recently enacted Food Security Act of 1985 (12/23/85), has several features that will be important for the future. Included is some linkage of commodity and conservation policy that is a first for the U.S.The new provisions include both incentives-the Conservation Reserve-and disincentives-Sodbuster and Conservation Compliance applying to the cropland defined as "highly erodible.Also,there will be an added disincentive-the Swampbuster-to retain valuable wetlands. These Federal activities are now being implemented and are most promising for the future of soil conservation.To fully explain each provision would be a full seminar.I would be

pleased to discuss these programs at your convenience.

37.16

The laws and policies now in place will carry us into the next decade.We can fine tune them and even change direction of the programs that have been the foundation of the efforts for the past fifty years,plus the new provisions of P.L.99-198,but Federal actions do have limits for expansion. Where will these conditions eventually lead us,as we move toward the year 2000?

To develop any type of future scenario requires making some assumptions about several factors: economics of production (presently in need of additional shrinking of capability to produce),demand (domestic and export),and the condition & trends of soil and water resources available for use in agricultural production.A key determinant will be the rate of annual increases in yields resulting from technolgy.

Domestic demands alone do not,will not unduly stress the natural resource base in the U.S.Therefore,soil conservation would continue to be a desirable activity,probably of lower priority for the federal government.This would place added responsibility on non-federal governments and the private sector for any acceleration of soil conservation-as it re-lates to the landowners of farms,ranches and forests. This effort could be strenghtened by federal matching grants or challenge-type funding for non-federal conservation actions. Grants to add to research,extension,financing and technical

assistance programs at the non-federal level,has not been an attractive feature for Congress,but it should be considered.

Export demands present a different challenge.In the last few years this has proved to be a very volatile area,depending as they do on global weather and climate patterns,the value of the dollar,global markets and politics.The rapid expansion of U.S.exports of the last decade-tripling in tonnage and sex-tupling in value-has been followed by a rapid decline. Increases in productivity-worldwide-makes many former import-ing countries -exporters for the first time in history.

Resources available will be ample for domestic needs,if properly managed and conserved.However,the stress of the past, tied to increased exports,could well return and should be the best reason for sustaining a strong agricultural base.

The setting of tougher priorities for the limited public resources (f unding and people) will continue to make sense. Targeting emerged as a central thrust in the National Conservation Plan,an outgrowth of the Soil and Water Conser-vation Act of 1977.Support for targeting was not universal in 1981,nor is it now.If it could be done with additional funds,instead of redirecting already limited funds it would be more acceptable.

What about the role of Conservation Tillage? It has been a highly cost effective practice at saving oil,toil and soil

(in about that order in the minds of the farmer).The simple answer is that it should be the first practice evaluated in conservation planning.There are additional research needs, and the long-term effect of pesticides is still of concern to environmentalists.CT It is not a panacea,for a resource management system requires other practices.However,all the evidence points to less emphasis on structural measures,that have become increasingly expensive.Those who are examining "alternative agriculture" have increased advocates.

Technology advances will continue,with the proper support for research.Biotechnology is without doubt already having an impact.It is one of the most important features of a long-range future.Excess agricultural capacity will probably grow in the the future.However,the best insurance policy for any nation,to offset conclusions about the future that may prove wrong,is to protect,conserve and pass on to the next generation a soil and water resource agricultural base that will give them the options that we have been afforded in our lifetime.

A Summary of Fifty Years of Soil Conservation in the U.S.A.

Based on past experience Soil Conservation policy never has and never will drive "Farm Policy".However,the need for more linkage of the two has been needed for decades.The 1985 Farm Bill integrated these for the first time,and this will help soil conservation by holding marginal land out of production of crops(both preventing it from coming in and,if it is in, converting it back to grass,trees,wilflife cover etc.).This continued relationship is necessary for successful action.

The U.S.Government will continue to be involved in the supply control business in agriculture:wheat,corn,cotton,rice,grain sorghums and soybeans.The CRP can become the primary vehicle for retiring highly erodible lands(in a decade-up to 90 million acres).This will also effect supply,benefit off-site problems,enhance wildlife habitat and provide farm income.

We will search for new conservation levers-and preserve existing ones that are time-proven: conservation districts, sharing of task,conservation programs,volunteer concept.

The definition of Highly Erodible Land is challenging: 2T, 3T,EI 8 etc.The soil loss equations are being tested.The ability to determine specific,on-site ratings is critical to landowner acceptance of the new provisions of P.L.99-198.

Finally,Professor Peter J.Novak,of the Univerisity of Wisconsin,gave the 9th Annual H.Wayne Pritchard lecture at the 41st annual event of the Soil Conservation Society of America in Winston-Salem,North Carolina in 1986.He said that challenges facing conservation partners are greater today than at any other time in history.Five trends have precipitated these new challenges.SCSA Journal,Sept.-Oct.'86,We must respond to:

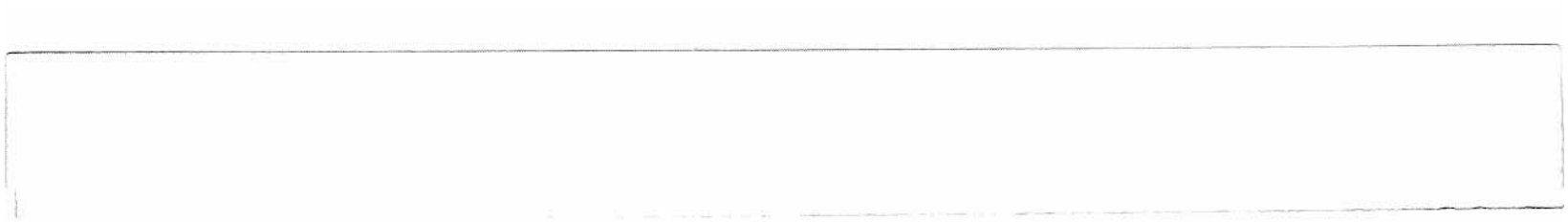
Trend one: A changing structure in agriculture,i.e.a reduced number of farms,their enhanced organizational complexity,and the increased scale of farm and ranch operations(a direct result of technolgy).

Trend two: Industry's role.The increasing role of private industry in agricultural management.Until now, production agriculture and conservation were treated as separate functions.Integration needed.

Trend three::The information revolution:Natural resource data,computer models,remote sensing,basic and applied research,coupled with a political mandate for policy effectiveness,have made for progress.

Trend four:New interest groups:New partners produced the new approaches in the Food Security Act of 1985.They are asking about the impact of agriculture on NR quality and quantity and they can be effective.

Trend five:Local governments role is increasing and will be more demanding : local leadership,funding and laws that respond to the diversity of land use issues.



Five Current Trends - IV

I. The Changing Structure of Agriculture

II A Technological Revolution in the Management of Conservation Information

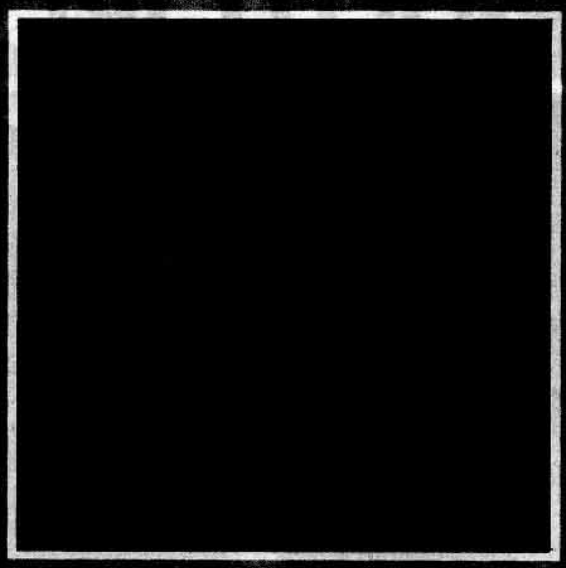
III Emergence of Non-Agriculture Groups in Formulating Conservation Policy

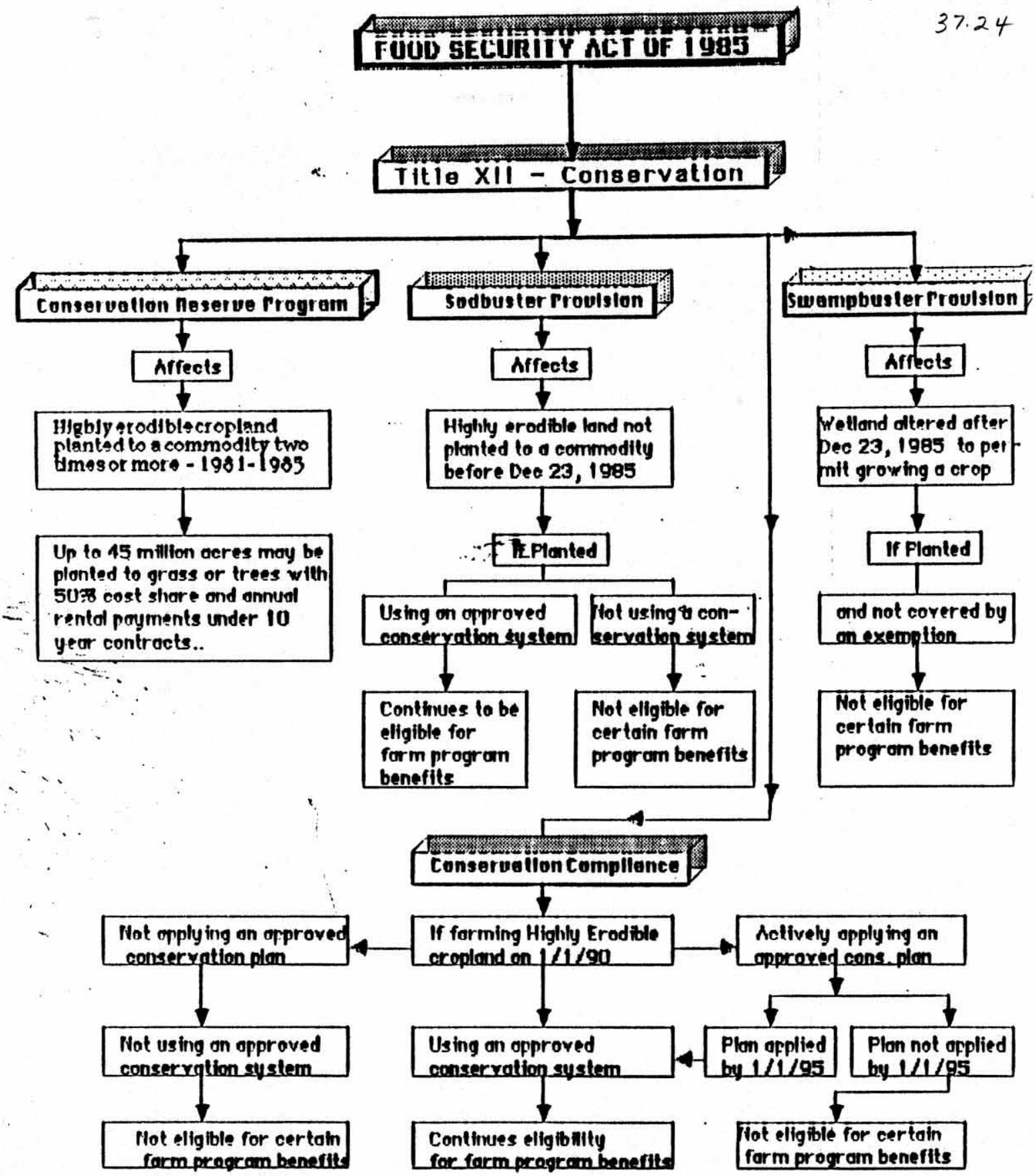
IV The Increasing Role of Local Government in Conservation

V Role of private industry in integrating conservation and production

Economics of Conservation

37.23




FOOD SECURITY ACT OF 1985
Title XII - Conservation
Conservation Reserve Program
Affects
Highly erodible cropland planted to a commodity two times or more - 1981-1985
Up to 45 million acres may be planted to grass or trees with 50% cost share and annual rental payments under 10 year contracts..
Sodbuster Provision
Affects
Highly erodible land not planted to a commodity before Dec 23, 1985
If Planted
Using an approved conservation system
Not using a conservation system
Continues to be eligible for farm program benefits
Not eligible for certain farm program benefits
Swampbuster Provision
Affects
Wetland altered after Dec 23, 1985 to permit growing a crop
If Planted
and not covered by an exemption
Not eligible for certain farm program benefits
Conservation Compliance
If farming Highly Erodible cropland on 1/1/90
Not applying an approved conservation plan
Not using an approved conservation system
Not eligible for certain farm program benefits
Using an approved conservation system
Continues eligibility for farm program benefits
Actively applying an approved cons. plan
Plan applied by 1/1/95
Plan not applied by 1/1/95
Not eligible for certain farm program benefits

	All Cropland	Cropland EI > 8	Cropland A > 2T, or Class VI, VII, VIII (Excludes Class I)	Cropland A > 3T, or Class VI, VII, VIII (Excludes Class I)
			million acres	
Total	421.4	117.9	104.0	69.4
Less than T	236.0	34.6	6.8	6.8
Less than 2T	324.7	53.9	9.1	9.1
Greater than 2T	96.7	64.0	94.9	60.3
Greater than 3T	59.7	49.3	59.0	59.0
Does not meet cropping history	75-85	27-28	14-15	10-11
Average Erosion Rate T/A per year	7.3	15.2	19.6	24.1

CRSTE18

CONSERVATION RESERVE CROPLAND
(SOURCE 1982 NRI)
(IN 1000 ACRES)

	EI=) 8 TOTAL	) 2T VI-VIII	EI=) 8 ELIGBLE C R P	EI=) 8) T	) 3T VI-VIII	EI=) 8 (T	Grass in Rot	Hort & Perm Hay	Totals Hort & Perm Hay & Grass in Rot	EI=) 8 ELIG CRP (T
Alabama	1,486.8	1,341.5	1,234.2	1,123.1	842.2	283.7	18.2	154.4	172.6	111.1
Alaska	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arizona	1,103.5	68.2	928.9	190.6	54.4	912.9	26.3	148.3	174.6	738.3
Arkansas	724.6	869.1	628.2	618.7	465.6	105.9	9.8	86.6	96.4	9.5
California	756.4	754.2	435.1	496.2	634.8	260.2	29.1	292.2	321.3	(61.1)
Caribbean	256.8	232.5	91.7	170.9	226.5	85.9	10.4	154.7	165.1	(79.2)
Colorado	6,124.8	4,925.9	5,633.5	4,514.5	3,677.6	1,610.3	71.8	419.5	491.3	1,119.8
Connecticut	69.9	54.2	22.9	21.5	47.8	48.4	0.8	47.0	47.8	1.4
Delaware	22.6	54.6	18.5	17.1	13.9	5.5	2.8	2.1	4.1	1.4
Florida	282.5	525.1	149.8	148.5	388.8	54.8	14.7	38.8	53.5	0.5
Georgia	1,883.1	1,283.2	939.4	980.5	766.2	182.6	27.8	115.9	143.7	35.9
Hawaii	138.6	67.8	124.4	87.5	53.7	43.1	1.7	4.5	6.2	36.9
Idaho	2,649.5	2,487.6	2,152.8	1,821.6	1,697.7	827.9	132.5	365.8	497.5	330.4
Illinois	4,188.8	4,782.8	3,590.2	3,644.2	3,853.2	464.6	270.4	248.2	518.6	(54.8)
Indiana	2,283.2	2,528.8	1,870.8	1,910.2	1,529.4	293.8	133.7	199.5	333.2	(40.2)
Iowa	8,214.8	10,835.8	6,832.2	7,128.7	6,624.2	1,094.1	892.3	490.3	1,382.6	(288.5)
Kansas	18,594.6	4,527.9	9,679.8	6,588.4	2,525.3	4,886.2	83.1	832.5	915.6	3,170.6
Kentucky	3,140.8	1,824.3	2,880.3	1,827.6	1,431.4	1,313.2	217.7	842.8	1,060.5	252.7
Louisiana	288.1	449.7	234.1	211.8	178.3	77.1	8.8	45.2	54.0	23.1
Maine	248.8	131.3	100.4	107.1	82.1	141.7	23.3	125.1	148.4	(6.7)
Maryland	641.5	362.9	476.1	484.9	241.8	236.6	53.4	112.8	165.4	71.2
Massachusetts	101.2	48.1	20.5	19.1	44.4	82.1	1.8	78.9	80.7	1.4
Michigan	617.8	1,140.6	394.2	418.9	679.3	206.9	38.7	184.9	223.6	(16.7)
Minnesota	1,636.1	5,887.2	1,176.1	1,287.5	1,984.2	428.8	213.5	246.5	460.8	(31.4)
Mississippi	1,786.1	1,516.8	1,635.3	1,504.1	1,092.9	282.8	43.5	107.3	150.8	131.2
Missouri	6,298.9	5,262.4	4,879.7	4,987.5	4,072.6	1,311.4	295.1	1,124.1	1,419.2	(107.8)
Montana	9,558.1	7,118.8	9,334.8	6,927.7	4,995.6	2,630.4	55.3	168.0	223.3	2,407.1
Nebraska	6,632.2	4,296.7	5,637.3	4,395.1	3,142.2	2,237.1	272.8	722.1	994.9	1,242.2
Nevada	75.9	197.5	59.2	68.3	192.1	7.6	3.1	13.6	16.7	(9.1)
New Hampshire	35.1	23.5	2.7	4.5	23.8	30.6	1.5	30.9	32.4	(1.8)
New Jersey	214.4	212.9	145.4	137.2	151.4	77.2	13.6	55.4	69.0	8.2
New Mexico	1,593.8	717.6	1,387.8	731.8	543.2	862.8	16.5	189.5	206.0	656.8
New York	1,994.3	858.3	718.3	1,140.2	536.3	854.1	246.9	1,029.1	1,276.8	(421.9)
North Carolina	1,717.2	1,602.3	1,448.8	1,333.1	1,142.8	384.1	41.3	227.3	268.6	115.5
North Dakota	2,271.5	4,278.7	1,734.1	1,571.1	2,853.9	780.4	86.6	450.8	537.4	163.0
Ohio	2,347.7	1,630.4	1,526.7	1,487.7	891.1	940.8	255.4	565.6	821.8	119.0
Oklahoma	4,699.2	2,230.2	4,506.7	2,714.8	1,459.7	1,985.2	53.3	139.2	192.5	1,792.7
Oregon	969.0	1,471.6	832.8	854.2	1,809.8	114.8	28.2	188.8	136.2	(21.4)
Pennsylvania	3,780.8	1,579.1	1,985.8	1,788.3	1,142.9	2,888.5	481.5	1,394.3	1,875.8	124.7
Rhode Island	3.9	3.5	2.8	2.8	2.5	1.9	0.8	1.9	1.9	0.8
South Carolina	469.7	342.9	384.6	325.3	214.3	144.4	6.8	79.1	85.1	59.3
South Dakota	1,783.4	2,877.9	1,345.8	1,384.8	1,855.6	399.4	73.8	285.4	358.4	41.8
Tennessee	2,513.1	2,848.2	1,954.5	1,820.7	1,589.6	692.4	78.7	479.9	558.6	133.8
Texas	13,903.8	14,511.1	13,471.3	11,098.8	11,465.3	2,812.2	111.8	320.1	431.7	2,380.5
Utah	615.8	373.2	331.5	333.5	329.3	281.5	23.6	259.9	283.5	(2.8)
Vermont	196.1	58.2	17.8	35.5	49.5	160.6	14.4	163.9	178.3	(17.7)
Virginia	1,612.9	841.5	914.8	803.5	606.3	809.4	112.6	585.5	698.1	111.3
Washington	2,396.1	2,336.1	2,175.1	2,867.8	1,582.4	328.3	52.9	168.1	221.8	187.3
West Virginia	605.9	220.7	78.8	99.3	203.7	506.6	43.6	483.5	527.1	(28.5)
Wisconsin	3,421.8	2,659.6	1,857.4	2,294.8	1,830.3	1,127.8	948.5	615.9	1,564.4	(437.4)
Wyoming	174.5	379.3	145.2	186.6	358.1	67.9	11.6	17.7	29.3	38.6
Total	117,915.6	183,941.1	97,242.5	83,322.1	69,489.6	34,593.5	5,652.1	15,021.0	20,673.1	13,920.4