

LAND USE CHANGES IN AMERICA:

Effects on Natural Resources

Congratulations on convening your 23rd National Watershed Congress. It's fitting that as you explore "Alternatives in Watershed Management," you are meeting in a region of our nation that has provided several of the people who have contributed greatly to giving America more alternatives in water resource action:

As I considered what to say this morning, I reflected on the philosophy of the watershed movement that these men helped develop. I looked at many of the previous 22 keynote addresses for the important issues, principles, and policies that they should have contained...and did. And since my topic is land use changes and the need to identify key trends that affect land and water, I read my newspapers and magazines with an eye to what's happening now.

From a look back, I would say our mission here remains the same as it has been since that first Congress in 1954. The planners proposed discussion on:

Material for talk by Norman A. Berg, Associate Administrator, Soil Conservation Service, at the 23rd National Watershed Congress, Biloxi, Mississippi, June 28, 1976.

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"How best can the conservation forces of the country coordinate their efforts so as to be most effective in working for--

- a) The federal and state legislation
- b) The federal and state budgeting practices, and
- c) The federal, state and local administrative procedures and agency coordination--

essential to a sound and well-balanced national land and water policy."

Still pertinent!

Or what about this early observation:

"Why has this approach to soil and water conservation and flood prevention so caught the attention and support of Americans?

"I think there are at least three principal reasons: First, it makes sense. Second, it is sound. Third, it provides for genuine teamwork of all affected interests.

"I have yet to find a man, woman, or child who could not immediately grasp the essential simplicity of beginning to control water where it first falls. Anyone who knows that water runs downhill--anyone who has seen the joining of trickles into rivulets, and rivulets into brooks, and brooks into larger streams--understands at once that the place to begin is at the top where runoff and floods start."

Still valid! Still basic. Still in need of emphasis.

And one more early comment:

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"We have learned that without the participation of local people themselves, no lasting solution to local problems can be had. Neither could the government provide really effective help until local people had their own team--their own organization that can see the local needs, develop the local program, provide local work and local money for needed work, and then maintain the program and perpetuate its benefits in a spirit of community pride and independence.

"What it takes is the realization that every interest is tied together by the physical and economic relationships that are inherent in each watershed."

Still a vitally needed understanding! And the physical and economic relationships in a watershed, blended with people's interests and needs, are precisely what determine land use in that watershed. Conversely, the patterns and problems in land use affect every other physical and economic relationship.

Today's headlines are full of land use and other resource issues, conflicts, solutions, and questions:

--A United Nations Conference on Human Settlements reports that "Land, because of the crucial role it plays in human settlements, cannot be treated as an ordinary asset, controlled by individuals and subject to the pressures and inefficiencies of the market."

--Meanwhile, a Virginia county board wins court approval of a plan to strip-mine vermiculite near a historic area.

--The Hudson Institute predicts an abundant life the world over by the year 2176, with history's highest period of world economic growth.

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--Meanwhile, a 1974 CIA study predicts long-term unfavorable climatic shifts worldwide, ushering in "a promise of famine and starvation to many areas of the world" along with social and political unrest.

--The Geological Survey reports this April was one of the driest months on record for the Potomac Basin.

--A United Nations conference approves a \$1 billion fund to develop agriculture in needy nations.

--The Secretary of State proposes to help the U.S. "roll back the desert" with certain drought-stricken nations, an effort that may cost \$7.5 billion over the next decade and require a great amount of technical help.

--The Soviet grain crop gets off to another bad start.

--While here in the United States, someone notices that the farm population has dropped from 50 percent at the turn of the century to just over 4 percent today and comments that only the big businesses can survive.

--Western states brace themselves for rapid large-scale mining of coal and oil shale deposits, and worry about such developments touching off "localized boom-bust cycles that would strain public services at the crest and leave areas desolate soon after...most of the development will take place in rural areas in which there is no real government structure to handle much of an influx of people...(Such an area) doesn't have a fire department or a police department.

It doesn't have streets. It doesn't have schools...and it can't get them." These concerns go far beyond the possible effects of mining on land and water quality.

--And a new publication, "The American Landscape: 1776-1976, Two Centuries of Change", says in its introduction:

"Nothing in nature is more constant than change.

"Even before the Indians reached North America, the face of the land was undergoing transition. Glaciers advanced and withdrew, carving lakes and contouring the landscape. Seashores rose and retreated. The beds of great inland seas became prairies and deserts. Most of these natural landscape changes were gradual and subtle, just as they are today.

"The arrival of man accelerated change. In the first three centuries, his efforts to change the land to fit his needs and desires were dwarfed by the vastness of the continent. But after 1776, the year of the nation's birth, technological development expanded and quickened. Americans, in increasing numbers that were swelled by immigrants from abroad, swept across the mountains and into the heartland of the nation to stake out homes and break the sod.

"In just two centuries--a wink of the eye in geological time--we laced the land with steel and concrete, leveled hills, and created lakes. We made the desert bloom. We created forests where, for millennia, no trees had grown. We carved extensive grasslands from the forests and replaced native prairie wildlife with domestic livestock.

"Man, through his inventions and two centuries of...building, changing and environmental tinkering, now is a force second only to climate in influencing the character of the landscape."

There is no question but that the use of our land is a basic yet complex topic and has emerged as a high priority issue. Concern over the use of land is increasingly evident. States increasingly have enacted legislation or are studying proposals to increase the previously limited role of state government in land use planning and policy. National land use legislation has been and will be a topic of continuing concern to the Congress.

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To better understand the importance of some land-use issues today, let's take a brief look at land use in the United States.

Of our nation's $2\frac{1}{4}$ billion acres of land, 58 percent is still privately held. We use this private land, according to a 1969 report by USDA's Economic Research Service, as follows:

--21 percent is cropland;

--27 percent is grassland, pasture or range; and

--32 percent is forest land.

The other 20 percent has a variety of uses--urban, wildlife, recreation, transportation...or is desert, tundra, bare rock, or marshland.

The 72 million acres in the 1,140 P.L. 566 operational watershed projects comprise just over 3 percent of our land area. Keep that perspective in mind.

Over the past few decades, the most dramatic changes have occurred on land used for crops--and therefore are of prime interest to USDA and to the other organizations engaged in small watershed project activity.

In the past decade the acres of cropland harvested went from 286 to 330 million acres--and continuing shifts to higher producing lands in most cases made them better acres.

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A quick note on exports: the year of your first Watershed Congress, the value of our agricultural outflow to other nations was some \$2.9 billion. By fiscal 1976, it has grown almost tenfold to nearly \$22 billion.

These achievements in food and fiber production were made possible through technological progress such as more efficient farming and ranching practices, and higher yielding crop varieties and livestock strains.

They also were made possible through--

- greater use of energy;

- greater mechanization;

- greater use of fertilizers and other agricultural chemicals; and

- land and water development through drainage and irrigation, and

- abandonment of lower yielding lands.

Production boosts have protected our international balance of payments. They also have resulted in more soil erosion, increased environmental contamination, and losses in soil fertility.

Another significant use for land is urban development. Still less than 3 percent of the total land area of the United States is urbanized. But at the rural-urban fringes, highly visible and rapid shifts in land use are occurring--triggered by social, cultural, political and economic forces.

These shifts include the siting of industrial plants, establishment of recreation sites, construction of second homes, expansion of transportation facilities, expanded surface mining for sand and gravel and other building products, and the like. When these land use changes occur, they profoundly affect adjacent rural areas--attracting subsidiary services, stimulating housing, and accelerating urban-related activities.

The earlier rush to the cities has been replaced by a move to the suburbs and to outlying areas within commuting distance of work in the city. Where "Burma Shave" signs stood 40 years ago, other signs now tout the virtues of suburban townhouses and condominiums--with, as I reported earlier, sometimes less than successful results. But in most cases the land use shifts, the environmental impacts, have already been made.

Most of the little towns and cities undergoing this type of explosive growth have been overwhelmed. They were--and many still are--ill-prepared and ill-equipped to deal with it. As new residents began moving in, they needed shopping centers, churches, and schools. But local governments had no guidelines for development. Where any community planning had been conducted, it was grossly inadequate.

From a natural resource viewpoint, the results too often have been disastrous: river and stream pollution...flooding...losses of marshes and other wetlands...losses of prime agricultural land...severe strains on water supplies and sewage disposal facilities.

Somebody is going to have to make decisions--perhaps unpopular decisions--about allocating resources. By whom and how is the tough question to answer.

Improvements in how land use changes are made would and should go beyond environmental considerations. Land use is more than an environmental issue--it is a fundamental human activity affecting every farmer, rancher, worker, and consumer.

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We cannot respond with single-purpose programs in a watershed project or any other activity. The land-use problems of today are interdependent and--in fact--different aspects of the same problem. It is timely to look at the whole picture, and to begin shaping a better process for deciding how land is to be used in the future.

There are few precedents available for guidance. Some answers will be difficult to develop. But watershed projects and river basin studies have been a strong, constructive influence in the past. They need to be stronger in the future.

Land use problems, like watershed problems, do not respect city or county boundaries and should be viewed from a broader perspective. Let us make sure we lend that broader perspective to every watershed project.

After all, many of the land-use decisions that will have to be made will affect water resource activities in a major way. Many issues that have arisen in watershed projects indicate lack of agreement in the community over land-use issues. Watershed action will not automatically result in desired changes in land use. In the absence of proper controls, watershed action may even motivate intensive development in places where it should be curtailed.

New water supplies, new recreation facilities, new wildlife habitat, stronger agriculture and agribusiness do help a community grow--but do they in some cases encourage so much growth that the values the community sought are not realized after all?

Look at it from another direction: What if a watershed area is "perfect" already and the local people want it to stay that way? What assurance do they have--what action plan do they have--to keep it that way?

The ability of watershed projects to stimulate land use changes has generated considerable interest in the economic literature, in part because projected land use changes have been used as a source of benefits in order to justify projects. If the planned land use changes don't occur, then the project may have been unfeasible to begin with and should have been revised or stopped.

In 1965 Neil Cook^{1/} studied three groups of watersheds in Oklahoma and concluded that in one group, increased intensity in flood plain use probably was due partially to flood protection. For the other two groups, he indicated that except for a small increase in percentage of bottomland cotton in one watershed, few increases in bottomland use intensity occurred.

In 1974 Gordon Sleggett^{2/} studied 56 watersheds in the Arkansas-White-Red Region that showed a general decline in land use intensity from 1966 to 1970. But on the 10 watersheds that had been completed at the time the data were collected, there was a significant increase in the acreage of cultivated crops as well as pasture. Gross value of production per acre from the completed watersheds increased as did the average value for all watersheds in the study.

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John Sutton^{3/} studied four watershed projects completed between 1966 and 1969 and found that agricultural land use did not intensify. Maxwell and Nath studied two watersheds in 1974 and found that the projects probably did not generate more intensive use benefits as expected.

In 1975, C. Dudley Mattson^{4/} looked at 60 watershed projects and found that although cropland expansion failed to take place as planned, the program appeared successful in encouraging conversion of upland fields to permanent vegetation. In the Mississippi Delta, he noted that the extension of drainage measures linked to the arterial system of major channels and levees has expedited the conversion of forest to intensive cropping on the flatland portions of the projects. In the Missouri Tributary region, however, watershed development seemed to result in little or no change in major land use patterns.

In summary, projections of land-use patterns are difficult to make, and you can draw almost any conclusion you want from random studies. The true impacts need to be assessed on a watershed-by-watershed basis. National land use trends by crops and by regions have not been consistent or predictable. It's not easy to find suitable "analogous" watersheds for proper "with project" and "without project" comparisons. And many projects just haven't been completed long enough to have their full effect on land use changes--or for land use changes to have their full effect on the watersheds.

One land-use issue that deserves particular attention in every watershed is prime agricultural land.

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It's obvious that continuing strong demand for the products of American farms and ranches will make our agriculture a growth industry without equal--because of trends in agriculture in other nations, emerging trade opportunities, changing weather patterns, and the like. It's obvious that the demand for productive acres will be much more complex than a simple extension of the demand for agricultural products--that there also are some non-commercial benefits of agricultural land, such as open space and economic diversity.

It's obvious that competition, conflict, and pressure over the use of prime agricultural land will increase because the supply of good farm-and-ranch acres is finite. Public policy is needed to assure that prime land is used wisely.

Yet there is disagreement over how far public land policy should go to keep privately owned lands in agricultural uses. Some of this stems from a lack of understanding of what is involved.

We need to resolve such questions about prime and unique lands as:

--What are they?

--Where are they?

--How important are they?

--Who decides what will happen to them?

--What should be done with them?

--If we decide to keep them in agriculture, how much should we keep?

In what locations? By what means? At what cost? At whose cost?

What is happening to our prime agricultural land? There has been a slight drop in land identified as cropland over the last several decades. Some land has become economically obsolescent, while other land has been reclaimed. Newly developed land--resulting from expanded irrigation, drainage, land clearing and development of dryland farming is currently appearing at a rate of about 1.3 million acres a year. But cropland has been released to other uses at the rate of 2.7 million acres a year. Low soil fertility, terrain unsuited to modern machines, and small uneconomic field units are among the reasons for these declines. Urban encroachment accounts for at least 500,000 to 600,000 acres of the cropland loss each year. This is not yet significant nationwide when compared to the existing cropland base and to the new cropland being developed. However, this loss can be very significant in local situations. Urban areas usually compete for the better agricultural lands, and conversions tend to be permanent.

On balance, average productivity per acre has probably increased because of the cropland change. New cropland has mostly been on more productive soils or on land better adapted to improved technology. The land dropped from crop uses, except for urban conversion is, generally less productive.

To analyze some of these intricate land use shifts, the Soil Conservation Service last year began compiling an inventory of the extent and location of the Nation's potential cropland. Combined with land use and land ownership data, this survey is beginning to outline the dimensions of our farmland resource.

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Our survey found that there are about 385 million acres of prime farmland in the United States. Of this, more than 250 million acres--almost 65 percent--are already in cropland. The other 135 million are now used for pasture, range, forest, and other uses. SCS pilot studies on prime cropland should be a big help to local planners in defining and evaluating possible options for land use.

The Department's Land Use Committee also has been studying the issue of farmland retention. We needed to know what kind of understanding would be developed and to evaluate policy and program directions that may be needed now and in the future. In July of 1975 we convened a Seminar on the Retention of Prime Lands at Airlie House, Virginia. At that meeting some 80 experts were asked to consider the current situation and trends and provide the Department with their best judgment as to what we should be considering and where we should be going. In preparation for the conference, some 50 background papers were written and at the conclusion the conference recommendations were assembled in published form. Both of those publications are available for those who are interested.

The main conclusion of that seminar was that that seminar was that

the continuing conversion of prime production lands to other land uses is a matter of growing concern that will require a great deal of attention in the future. The Department of Agriculture was urged to take a major role in advocating the retention of the maximum possible base for the production of food, fiber, and timber products of our country. One recommendation read as follows: "It should be USDA policy to avoid, and to encourage others to avoid, the diversion of highly productive farm and forest lands to nonproductive uses wherever feasible alternatives exist."

Participants at the Prime Lands Seminar also recognized, however, the important limits of any federal role in private land use planning and control. While the Department was urged to take an active role in developing policies and programs to discourage the conversion of prime to other uses, it was also noted that the authority to control private land uses rests solidly with state and local governments.

This indicates, I think, a major policy outlook that has consistently marked the Department's approach to this issue. We are concerned about the retention of adequate land in farm production. We are looking very hard at Departmental policies and programs to assure that our own actions are not leading toward the unnecessary conversion of prime lands to other uses. We seek opportunities to encourage others to take a similar stance. But at the same time, we recognize that the real responsibility for determining which land will be ultimately urbanized and which will be retained in agriculture rests with the private owners of that property operating under land use controls of state and local governments.

Since that Prime Lands Seminar, the Department's agencies have been carrying out a great deal of working in response to the recommendations. We have encouraged several states to conduct prime lands workshops to draw out the views of people at the state and local level. To date, two workshops have been held. Several are planned for this coming fall. planned for this coming fall.

The things we learned from these workshops, are of considerable interest.

We hear quite clearly, for instance, that the perspectives on farmland differ greatly between the federal, state and local levels. We are getting the message that even though these perspectives are different, they are all very real. In order to thoroughly assess the issues surrounding farmland, then, we need to understand all of these perspectives and add them to get a total picture.

First, it is becoming apparent that the National perspective is concerned mainly about the quality and quantity of the land, rather than the location. So long as we have enough corn land to meet National requirements, it is not a significant concern at the Maryland level whether that land is in Maryland or Illinois. It is in the National interest to keep the most productive acres in the country available for all types of crop production should they ever be needed. National policy will be best served by encouraging continued production on those acres that give the highest return for each unit of energy and at the same time provide the most stable and nonpolluting environment for agriculture.

A second perspective is seen at the local level. Here the most important concern appears to be the protection of management options

over land. Keeping viable economic farm units in production, protecting local economies, and preserving the nature of the community, including open space, visual quality and environmental quality are important issues. In many communities the retention of a lifestyle associated with agriculture is of key importance. Therefore, it appears that local values will often consider farm units rather than high quality acres. Many communities prize a dairy industry even though supported by land of mediocre productivity.

Somewhere between the local and National is a state perspective, more difficult to clearly articulate. In large measure, is it a concern for economic activity within the state? This appears to be most clearly felt in those states that are either unique in some respects, or else are at the end of the food delivery line. In Massachusetts, for example, they place a very high importance on encouraging the maximum possible productivity on their limited farmlands. They feel uneasy about the problems that can be created by a disruption of energy supplies or transportation systems or some other unforeseen event. An indication of that concern was the title of their state workshop: Survival of Agriculture in an Urbanizing Environment.

Another state perspective is based on the state's responsibility to provide the legal and policy bases on which day-to-day land use decisions are made. Virtually every state is evaluating its current set of laws and authorities regarding land use to see whether the effect on agricultural land is harmful or beneficial.

In addition to the views that emerge from different levels of government, there are perspectives that are regional in nature. We

don't hear the same story about agricultural land in California that we hear in Iowa or in Mississippi. Completely different sets of issues are involved, based on the resource situation and the political and economic climate that exists there today.

There is also a "people factor." At one workshop, speakers speculated about the existence of "three cultures" in the debate. One group are the urbanites, looking out toward the farmland with a feeling of dependence, knowing that their future well-being and food supply depend on that land. These are also the people who prize open space, visual quality, and similar farmland values. These people can become very concerned about the need to retain an adequate land base.

Another viewpoint, however, is that of the production farmer, who sees the land as a basic part of his business. In most instances, the land represents the farmer's most valuable asset and his major investment toward retirement. He, therefore, has mixed feelings about "preservation" programs. He recognizes that farmland must be retained for his business to survive, but at the same time he wants to be free to sell out for economic security in retirement. Therefore, a farmland preservation effort that lowers the salability of his property—or greatly reduces its value—will generate real concern and opposition.

A third group of people view land as a necessity for survival in an uncertain world. The back-to-the-land movement, although it is difficult to quantify, appears to be significant in some parts of the country. More and more families are leaving urban areas to live on 10, 20, or 40 "farmettes" in rural America. The concerns we hear from these people are about land availability, land prices, and suitable technology for small agricultural enterprises.

So, it appears that there are many layers of different perspectives on this issue. The federal, state, and local points of view are clearly different, and each is very important. Regional differences across our country are significant, and the way in which people view this issue is often very different and, at times, conflicting.

What this suggests is a complex, plural issue that demands a complex, plural response. We need to develop many tools at all levels of both public and private endeavor. This issue is not a rural or farm problem and it's not an urban problem. It is everyone's problem. Retaining an adequate agriculture cannot be considered separately from developing an efficient, high quality urban form.

There are important implications for local and state economic conditions, tax structures, and governmental revenues that can result from any policy to retain agricultural land. It is not always clear which way these are going to cut. There can be both positive and negative impacts from either developing or protecting farmland. Determining the direction and magnitude of these impacts in any situation is going to require a concentrated effort.

Land use decisions regarding agricultural land are going to be made on limited information. One tendency in the past, unfortunately, has been to see each land use change as a single event and assume that each single farmland loss is too small to be of any consequence. That is a dangerous strategy, however, that will need to be changed. Even though we do not know when the margin will be reached, or how serious our farmland problem will be at any given time, it is no longer acceptable to

view our farmland resource base as inexhaustable. There are limits, and we must respect them even though we can't firmly identify where they are. As a community and as a nation, we have the moral and ethical responsibility to avoid the waste of prime land resources for short term economic gain.

What does all this tell us as we look into the future? First, there is a growing commitment on the part of the Department of Agriculture to assist your efforts to evaluate the farmland situation in your region. As Secretary Butz has pointed out, our Department is concerned with land use alternatives and priorities, particularly those that involve the expenditure of federal funds. He has said, "Federal projects that take prime land from production should be initiated only when this action is clearly in the public interest." The federal government, if it is to be concerned about the retention of prime farmlands, needs to first minimize its own actions in taking them from production.

In response to another recommendation from the Prime Lands Seminar, the Department has asked the Council on Environmental Quality to consider prime farmlands as an essential National resource to be considered in the development and review of environmental impact statements for federally assisted projects. The process of establishing National goals for preservation of certain types of land has led to restricting development on wetlands, flood plains, areas of archeological and historical significance, critical areas, coastal areas, and on and on and on. What this has done essentially is increase development pressure on the best farmland in the Nation. In our view that is no longer acceptable. This is not to say that there won't be any future development on farmlands, for in some cases there will certainly need to be. What we are saying, however, is that the Nation's people must begin to count the cost of developing farmlands and balance those costs against other options.

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However, I believe that the small watershed approach is uniquely suited for looking at land, water and other resource needs in a meaningful package. I believe the small watershed approach is uniquely suited for getting results in optimum use of land, water and other resources. Optimum use is the real message of the National Environmental Policy Act and all of the standards and guidelines and regulations that have followed it.

I believe ~~watershed projects can give more focus to~~ ~~give more focus on~~ land use concerns, especially prime agricultural land, wetland, and other areas of environmental significance.

I believe ~~watershed projects should put more emphasis~~ ~~put more emphasis~~ on land treatment and on non-structural measures including land-use controls and several forms of flood plain management.

SCS is committed to improve watershed projects in other ways--

- To plan, install, and monitor them better;
- To design and build better structural measures;
- To streamline the planning process, especially the environmental impact statement;
- To get more facts to aid in planning;
- To get more people involved in planning;
- To emphasize improvement of water quality; and
- To help communities find other programs that can meet their needs

where watershed projects turn out not to be the most suitable answer.

The planners and sponsors of each watershed clearly should understand the aims of the local people, what their resources are, and whether the governmental process is adequate to be certain their aims can be met.

The ERS report last year, "The Small Watershed Program and Its Role in Community Development," showed a high degree of public satisfaction with watershed projects. It showed a high interest in expenditures for land treatment as well as for water-supply features. It gave some suggested improvements such as more attention to structural maintenance. ~~Are there~~ other improvements that can help watershed projects optimize their contribution to community development and environmental protection?

That's why you are here this week.

May your discussions be meaningful and may your alternatives in watershed management be truly comprehensive and practicable.

The future of American land and water hangs in the balance, for in another 23 years the world will ~~be~~ entering a new century.

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