

Commentary

Harvey O. Banks

Introduction

Dr. Howe's excellent paper sets forth clearly the present and future conflicts over water. He correctly points out that these encompass far more than conflicts over uses. Basic policies and institutions are in conflict as well.

For this presentation, only the following points of conflict and inconsistency will be discussed:

- federal policies, including inconsistencies;
- trade-offs against agriculture;
funding for water development; and
- interbasin transfers.

All of these—and many more—are involved in the \$6 million Six-State High Plains–Ogallala Aquifer Area Regional Study now in progress. This comprehensive study of resources and economic development alternatives will be briefly discussed in a separate paper.

Federal Policies

On June 6, 1978, President Carter sent to Congress a series of water policy initiatives designed to:

- . . . improve planning and efficient management of Federal water resource programs to prevent waste and to permit necessary water projects which are cost-effective, safe and environmentally sound to move forward expeditiously,

- . . . provide a new, national emphasis on water conservation,
- . . . enhance Federal-State cooperation and improved State water resources planning, and
- . . . increase attention to environmental quality.¹

On July 12, 1978, the president issued thirteen directives to the heads of executive departments and agencies to implement the water policy initiatives. Nineteen federal interagency task forces, with minor state participation, were established to prepare reports on implementation. Some final task reports have already been submitted.

The president's water policy initiatives cover a wide range of water and water-related proposals. All are of vital concern to the water industry, public and private. The financial community, with its large investments in activities dependent on adequate water supplies of proper quality, has much at stake. Several of the initiatives can be implemented by the issuance of regulations; some regulations have already been published. Others, such as increased cost-sharing by nonfederal interests, would require congressional action; bills are now pending before the Congress.

Space does not permit examination of all of the initiatives and their implications here. Discussion will be limited to:

- water conservation as a principal thrust in federal water resource planning and development,
- emphasis on instream flows,
- emphasis on enforcement of the environmental statutes,
- groundwater,
- nonstructural measures, and
- federal non-Indian reserved water rights.

None of the water policy proposals, except possibly in the long run those dealing with reserved water rights, would resolve any of the conflicts so ably discussed by Dr. Howe. In fact, some of the existing conflicts would be exacerbated. None present rational bases for achieving an equitable balance among the economic, environmental, and social values that should be

considered in the allocation of scarce water resources and the funding necessary for water resource developments to meet the manifold demands.

Conservation

The administration places great emphasis on conservation, i.e. reduction in the use of or demand for water. All federal and federally assisted programs are to incorporate a water conservation element.¹ Conservation in use of water for irrigation is given special attention; it is alleged that 20–30 percent of the amount of water presently used for irrigation could be saved through various conservation measures.

There seems to be a feeling, particularly among the non-professionals who have involved themselves in the water resource field, that many of the current water problems and conflicts could be resolved through conservation and that, therefore, new water development projects are not necessary now nor for at least some time in the future.

There is no question that some water could be saved through conservation. However, it is not generally recognized that there are costs involved with implementation of any conservation measure that, in some cases, could exceed the resultant benefits. On a hydrologic unit basis, there are situations (the Central Valley of California, for example) where a significant reduction in irrigation usage would achieve little overall conservation on a basin-wide basis. It would, in fact, be detrimental to certain other uses and needs—downstream salinity control and important wildlife habitats, to cite but two examples. These realities are not widely understood. Some new conflicts may develop as the conservation measures are implemented.

Instream Flows

Much greater emphasis in federal water resource planning and development, including operation of existing federal projects, is to be given to instream flow needs, particularly as related to recreation, water quality control, aesthetics, and fish and wildlife habitat.³ There is little question that these needs have been accorded inadequate attention in the past and that greater consideration in future water allocations is justified.

However, serious conflicts are almost certain to develop—particularly on the many streams already over-committed and in states where laws do not consider such needs as beneficial or where a relatively low priority is accorded to such uses.

Enforcement of Environmental Statutes

Some twenty-six environmental statutes are listed in the Task Force report.⁴ These are to be carried out more vigorously by the federal agencies involved. New rules and regulations have been issued under the National Historic Preservation Act,^{5,6} and implementing procedures are being prepared. Proposed rules and regulations under the Fish and Wildlife Coordination Act⁷ have been published in the Federal Register.⁸

Of the twenty-six statutes, twenty-one impact directly on the planning, development, and utilization of fresh water resources, particularly surface waters. While full attention to protection and, where feasible, enhancement of the environment is certainly warranted, enforcement of several of these statutes will add to current controversies over allocation and use of scarce water resources for multiple purposes.

Groundwater

Increased attention to groundwater resources and problems is to be given in federal and federally assisted planning and programs that impact on groundwater resources. The ultimate objective is comprehensive water management.' The federal water resource agencies are to be much more involved with groundwater, both internally within the federal establishment and in cooperation with the states. Appointment by the president of a broadly-based National Groundwater Advisory Commission, with a three-year life, is recommended in the Task Force report to “. . . guide and assist the individuals and cooperative efforts of Federal, State, and local governments in the alleviation or prevention of major public problems associated with the conservation, utilization and management of the groundwater resource.”

There is increasing recognition on the part of many groundwater users of the necessity of some degree of groundwater management, especially in critical groundwater overdraft areas.

There is, however, rather widespread antipathy on the part of groundwater users in Texas and other states toward having the responsibility of designing and implementing management programs vested in either the state or the federal government.¹⁰ Local control is considered best.

Groundwater management for overdraft areas is interpreted by many as requiring reduction in extractions to the degree necessary to bring the basin or aquifer into balance. This would entail severe economic dislocations where other sources of water supply are not available. However, proper management even under such continuing overdraft conditions would be beneficial.

Nonstructural Measures

The president has directed that at least one nonstructural alternative be formulated and evaluated in all federal water resource planning efforts. This implies that there must be a nonstructural solution to each water resource problem. This is by no means necessarily correct nor would nonstructural measures necessarily minimize conflicts. Flood plain management may engender serious land use conflicts.

Federal Non-Indian Reserved Water Rights

Federal non-Indian reserved rights are to be quantified." Negotiation rather than litigation is to be the method of settling disputes wherever possible. Close cooperation with the states is to be maintained. Assuming that quantification will be accomplished within the limitations on reserved rights established by the U.S. Supreme Court in *United States v. New Mexico*,¹² this could lay to rest some of the long-standing uncertainties and conflicts concerning federal water rights versus water rights acquired under state water laws.

Inconsistencies

Dr. Howe has pointed out the ". . . inconsistencies between water policies and policies in agriculture, transportation, and inflation control." The writer would go further and say that not

only are there inconsistencies but that there is not now, there never has been, and there is not likely to be in the near future a consistent, comprehensive federal water policy pursuant to which rational decision as to water resource allocations, authorizations of projects, and appropriations of funds could be made. Much of what is termed 'water policy' in fact concerns procedural matters. Nor are there defined policies in other resource fields that water supports. Water resources are developed and used in support of other resource developments and uses—irrigated agriculture, for example. In the absence of a defined policy with regard to the future of irrigated agriculture—and there is none—it is impossible to do rational water resource planning and make rational decisions as to the proper allocation of water resources to that purpose. The same is true with regard to other resources for which water is used—fish and wildlife, for example.

Decisions as to authorizations of projects, the allocations of yield therefrom, and the appropriations of funds continue to be made each year on an ad hoc basis.

Trade-Offs

As Dr. Howe states, in considering trade-offs between the use or the reallocation of water for high value uses (such as energy production) and its use for irrigation, there are costs in addition to the direct loss in farm output that must be evaluated—possible direct and indirect regional income losses, possible reduction in employment (both direct and indirect), social costs due to reduction in farm income and employment, and loss of the amenities and "economic balance" associated with agriculture. These are important values economically, environmentally, and socially and should be fully considered in federal planning as well as by the states and local governments.

Funding

Perhaps the most critical conflict at the present time is the competition for appropriations among the many programs financed from limited public revenues. The proportion of federal

funds allocated for investment in water resources—apart from appropriations under the Clean Water Act—has been declining for several years past. There appears to be little prospect of halting this trend, at least under the present administration with its emphasis on the solution of problems primarily through conservation and nonstructural measures.

Appropriations each year are made largely on an expedient basis. There has been no comprehensive national planning or even thoughtful consideration as to the future demands, broken down by regions and subregions, for water and the needs for new projects over time. Thus, there exists no logical basis for decision-making with regard to project authorizations and appropriations.

Interbasin Transfers

As Dr. Howe correctly states, "Large-scale interbasin transfer may, at some point in time, comprise an important part of rational regional or national water plans." Interbasin transfers, both intrastate and interstate, will be necessary if the overdraft and eventual exhaustion of the groundwater resources of the Ogallala Aquifer (extending from western Texas and eastern New Mexico northward to South Dakota) is to be halted. The same is true of the east side of the San Joaquin Valley, California, with a current overdraft exceeding 1.5 million acre-feet per year, where this could be accomplished by an intrastate, interbasin transfer. Without imported water supplies, the flourishing irrigated agricultural economies of national importance will shortly begin to decline with resultant severe economic dislocations, and significant environmental and social costs.

As Dr. Howe aptly points out, the costs of future interbasin projects would be very high and would be subject to a high degree of political dissension. The political, financial, economic, environmental, and social problems inherent in any interbasin transfer must be fully recognized. These may be an order of magnitude greater for an interstate transfer scheme than for an intrastate transfer.

The writer has had considerable experience with the planning

and implementation of one of the largest interbasin transfer projects in the United States—the \$3 billion California State Water Project. It is his conclusion that for any such scheme to be implementable, the needs of the basins from which water would be exported must be recognized and fully provided for on a first-priority basis. This is an extremely complicated matter outside the limits of discussion here.

The basic questions are: Would the totality of national, state, and local benefits—economic, environmental, and social—resulting from an interbasin transfer scheme justify the large costs involved? What degree of federal investment would be justified, since federal participation would be required in most instances? What would be necessary to fully protect and satisfy the basins and states of origin? These are fundamental considerations in the \$6 million Six-State High Plains–Ogallala Aquifer regional planning study discussed in the accompanying paper.

Conclusion

Little if anything has been actually accomplished toward resolution of the conflicts in water that have been with us for many years. In fact, some may have been exacerbated under the president's water policy, even though the objectives of certain of his initiatives may be worthwhile.

Notes

1. *Press Release*, The White House, Office of the White House Press Secretary, June 6, 1978.

2. *Water Conservation: Preliminary Proposals for Federal Agency Program Changes*, Water Conservation Task Force 6a, U.S. Department of the Interior, Office of Water Research and Technology, November 9, 1978.

3. *Guidelines for Determining Instream Flow Needs*, Interagency Task Force—Instream Flows, Water Policy Implementation, May 1979.

4. *Water Policy Implementation Task Force on Environmental Statutes*, Report, U.S. Department of the Interior, Office of the Assistant Secretary for Fish and Wildlife and Parks, August 1979.

Commentary

5. 16 U.S.C. 470.
6. *Federal Register*, January 30, 1979.
7. 16 U.S.C. 661-667e.
8. *Federal Register*, May 18, 1979.
9. *Ground Water Supply—Federal State Cooperation, Report of Task Force 2b*, June 4, 1979.
10. *District Groundwater Planning and Management Policies on the Texas High Plains: The Views of the People*, Frank L. Baird, Associate Professor, Department of Political Science, Texas Tech University, Lubbock, Texas, July 1976.
11. *Draft Report of Federal Task Force on Non-Indian Reserved Rights*, Task Force 5a—President's Water Policy Implementation, June 1979.
12. 438 U.S. 696, 698-700 (1978).

Six-State High Plains–Ogallala Aquifer Area Regional Study

Harvey O. Banks

Introduction

This comprehensive resource and economic development study was authorized by Congress October 26, 1976, in Section 193 of Public Law 94-587, with authorization for a \$6 million appropriation. The moneys were appropriated in fiscal years 1977–78 and 1978–79. Responsibility for the study was assigned to the Secretary of Commerce. The Economic Development Administration (EDA) of the U.S. Department of Commerce is conducting the study on behalf of the secretary.

At the insistence of the six states involved—Colorado, Kansas, Nebraska, New Mexico, Oklahoma, and Texas—the High Plains Study Council was formed, consisting of the governors of the six states, three representatives of each state appointed by the governor, and a federal member from EDA. The council is responsible for directing the study, for preparing final recommendations, and for submittal of the final report to the secretary of commerce. In February 1977, the council adopted a plan of study that is the basis for the comprehensive study now in progress.

On September 22, 1978, EDA awarded a contract to Camp Dresser & McKee Inc. (CDM) as prime contractor and leader of the general contractor team for the study, under the author's direction as officer-in-charge and project director. Ms. Jean O. Williams, CDM vice-president, is project manager. Associated with CDM on the general contractor team are Arthur D. Little, Inc. (ADL) of Cambridge, Massachusetts, and Black & Veatch (B & V), Consulting Engineers, of Kansas City, Missouri. ADL

is responsible for the agricultural-economic-social aspects of the study, and B & V for the energy aspects. Each of the six states, as subcontractors to CDM, will conduct certain portions of the study as outlined below. The U.S. Corps of Engineers, under separate contract with EDA, is conducting studies of sources, yields, and costs of potential interbasin transfers.

The study is being coordinated with other relevant studies and programs by federal, state, and local agencies, including among many others those by:

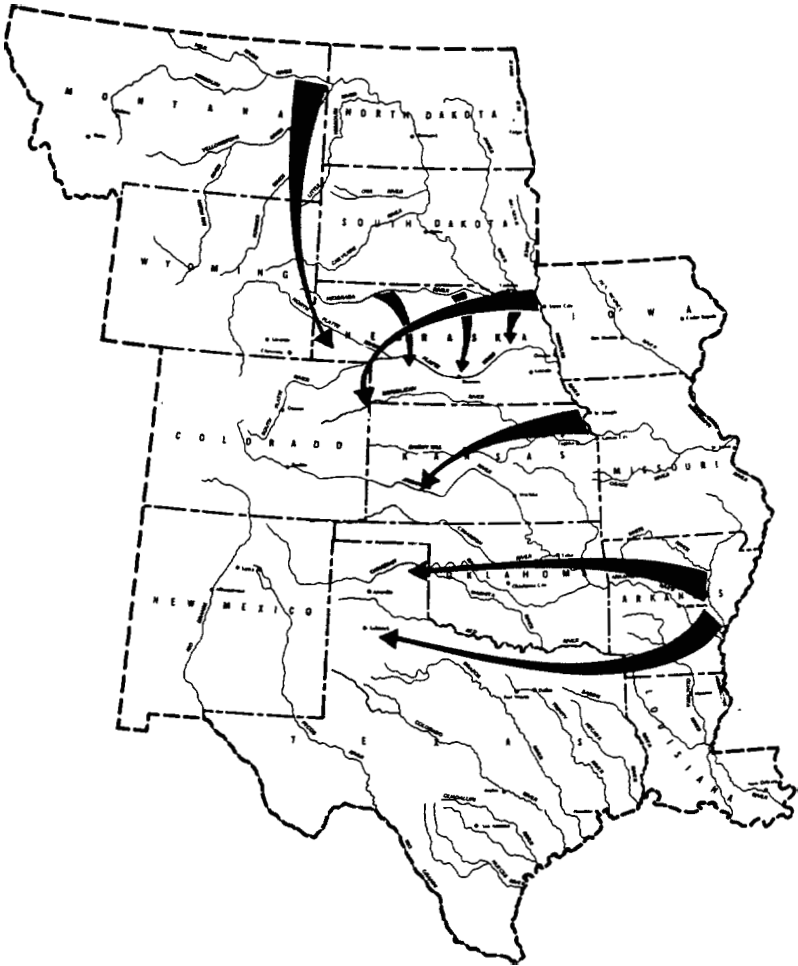
- United States Geological Survey—Ogallala Modelling Study
- United States Bureau of Reclamation—Llano Estacado Study of Playa Lakes
- U.S. Department of the Interior, U.S. Bureau of Reclamation and U.S. Fish and Wildlife Service—Platte River Habitat Study
- U.S. Department of Agriculture
- U.S. Corps of Engineers

A draft final report is to be submitted by the general contractor to the High Plains Study Council on or before March 31, 1982, and a final report on or before June 30, 1982.

The Study Area

The Ogallala Aquifer and the study area are shown in Figure 1. The study area includes some 180 counties in the six states lying wholly or partly over the Ogallala and encompasses 225,000 square miles. The area is one of the largest and most important agricultural areas in the United States as shown by Charts 1-7 appended to this paper. It includes some 20 percent of the total national irrigated acreage. There are about 90 million acres of irrigable land. The soils are deep and fertile. The climate is conducive to high agricultural production. Over 40 percent of the beef cattle supplying the tables of U.S. citizens are fed on the High Plains. The Ogallala Aquifer is now the principal source of water for irrigation. Recharge to the aquifer is very small.

Figure 1



INTERBASIN TRANSFER STUDIES

The Problem

The region is faced with ultimate exhaustion of the groundwater resources unless additional water can be made available although the timing of final depletion would vary widely since the Ogallala is not uniform in thickness or in hydrologic-hydraulic characteristics. Groundwater levels are declining rapidly in most of the area, with consequent increases in pumping costs. Production of oil and gas, which has been an important aspect of the total economy of much of the area, is also declining. The price of energy for pumping irrigation water has increased rapidly. Much of the area could be forced to revert to dryland farming or be abandoned in the near future. Some farms, particularly in the south High Plains of west Texas have already reverted. Deterioration of the agricultural economy of the High Plains-Ogallala Aquifer Region would have grave consequences for the business and financial communities outside as well as those located within the region.

The Objectives

In authorizing the study, the Congress and the states recognized the problems associated with the decline and, over the long term, possible exhaustion of the Ogallala Aquifer and the economic effects of declining oil and gas reserves. The study is based on the recognition that the problems are regional in nature with potentially severe adverse national implications and that new institutions might be necessary.

The congressional objectives, as excerpted from Public Law 94-587, Section 193, are:

- to assure adequate water supplies to the area
- to assure an adequate supply of food to the nation
- to promote economic vitality of the High Plains region
- to develop plans to increase water supplies in the area
- to assure continued growth and vitality of the region

In its adopted plan of study, which is the basis for studies

by the general contractor and the states, the High Plains Study Council stated the objectives as follows:

- to determine potential development alternatives for the High Plains Region
- to identify and describe the policies and actions required to carry out promising development strategies
- to evaluate the local, state, and national implications of these alternative development strategies or the absence of these strategies

The objective of the studies by the general contractor, including those by the states, is to develop factual evaluations of the several potential alternative futures or alternative development strategies for the High Plains–Ogallala Aquifer Region. This array of the region's potential and alternatives for achieving that potential will provide the High Plains Study Council, the Congress, the state legislatures, and other decision-makers a meaningful opportunity to make knowledgeable decisions as to the course this region may elect to follow and the role this region is to play in the nation's future.

As noted above, the general contractor will report its evaluations of the potential alternative futures to the High Plains Study Council, which in turn will report to the secretary of commerce with such recommendations for further action as it deems advisable. The secretary will report to the Congress.

The Study Organization

The Technical Advisory Group is composed of representatives of the principal federal agencies with interests in or involved with the study, appointed at the request of EDA. The Consulting Advisory Panel, appointed by the general contractor, comprises twelve nationally and internationally recognized experts in resource management, agriculture, economics, engineering, social analysis, and laws and institutions.

As previously indicated, CDM is responsible, as prime contractor, for management of the entire study, for the water resource,

environmental, legal, and institutional studies, and for the final report. Arthur D. Little, Inc., is handling the agricultural, economic, and social aspects. Black and Veatch is conducting the energy studies. There is continuing interaction among the three firms.

Alternative Development Strategies

The following alternative development strategies, or alternative futures, have been formulated by the general contractor and approved by the High Plains Study Council for analysis and evaluation in the study.

Baseline. Continuation of current local, state, federal policies, and trends. No new state or federal programs.

Water Resources Alternatives. Alternatives are listed in order of increasing costs and increasing potential availability:

- Water Demand Management—encourage users to practice conservation through application of proven technology; provide incentives for the farmer to conserve.
- Water Demand Management—apply all advanced water and agricultural management technology on a broad scale, identifying any necessary constraints.
- Local Water Supply Management—augment water supplies at the local level with techniques such as artificial recharge, weather modification, land management, snow pack management, vegetation management, desalting, evaporation management, and others.
- Subregional Intrastate Importation Supply Management—augment local water supplies with interbasin transfers of surface water as available.
- Regional Interstate Importation Supply Management—augment local water supplies with major interbasin transfers of water, possibly providing for expansion of irrigated acreages.

Nonagricultural Development Alternatives. Nonagricultural Alternatives—development and use of available resources for purposes other than agricultural production. These alternatives are not mutually exclusive. For a particular subregion, or combination of subregions, a mix of alternatives may be found to be the best solution to meet objectives. The results of analyses and evaluations of the water resource and nonagricultural development alternatives will be compared to the adverse effects of the baseline or "no action" alternative.

It is important to note that this concept of analysis of alternative development strategies for the High Plains-Ogallala Aquifer Region was very clear in the thinking of the Congress, EDA, and the states as this study was formulated and authorized. The thrust of the regional approach embodied in the study is identification of these things:

- What choices for the region are available?
- Who must make those choices?
- What does each alternative mean in terms of possible beneficial and/or adverse economic, environmental, and social impacts?
- Are those impacts local, regional, national, or some combination?
- How, by whom, and at what costs could selected alternatives be implemented?
- To what degree would there be a federal interest and justification for federal investment?

State Research

State agencies and universities for each of the six states are now engaged in the following studies as specified by the High Plains Study Council:

A-1 State Agriculture and Farm Level Research

Project cropping patterns, agricultural output and output value, inputs and input costs, and agricultural employment and income for each alternative development strategy.

A-2 Energy Industry Impacts

Project energy production, energy requirements for irrigation, employment, royalties, and other income from energy, industry, and water requirements.

A-3 State Water Resources Evaluation and Impacts Research

A-3.a. Evaluate intrastate water resource situation; project intrastate water supplies and demands under each alternative development strategy.

A-3.b. Project economic adjustments and socioeconomic and environmental impacts at the subregional and state level resulting from changes in land use and changes in supply and uses of water, energy, and other sources under each alternative development strategy.

Results of the state research will be used by the general contractor in the regional and national analyses.

Research by General Contractor

The regional and subregional research studies by the general contractor will analyze:

- B-1 Interbasin transfers—in cooperation with Corps of Engineers.
- B-2 National and regional changes in commodity prices, shifts in agricultural production, changes in consumer prices and shifts in consumer expenditures.
- B-3 Effects and costs of applying advanced agricultural and water management technologies to achieve more efficient use of water.
- B-4 Environmental impacts.
- B-5 Technologies for augmenting locally available water supplies and costs.

- B-6 Legal and institutional frameworks for implementing alternative development strategies.
- B-7 Crop price projections; analyses of total revenue and costs for wide range of commodity and livestock enterprise situations.
- B-8 Energy prices and technology.
- B-9 Impacts of transition to dryland farming.
- B-10 Regional and subregional potentials for nonagricultural development.
- B-11 Evaluation of alternative development strategies.

Evaluations of the alternative development strategies will be reported to the High Plains Study Council for consideration and recommendations to the secretary of commerce.

All of these studies, which were directed by the High Plains Study Council plan of study, are presently under way. The research is being fully coordinated with federal, state, and local plans and programs.

Interbasin Transfer Studies by U.S. Corps of Engineers

The Corps is studying potential sources of water that might be imported to the High Plains–Ogallala Aquifer Region, potential yields, costs of diversion, possible routings and costs for conveyance, amounts and costs of necessary terminal storage reservoirs, and environmental impacts. Possible sources and conveyance routings are shown in generalized fashion by Figure 2. The Corps studies are being carried out in close coordination with the studies of interbasin transfers being conducted by the general contractor.

Final Products of the Study

For the states involved, the region, and the nation, this study

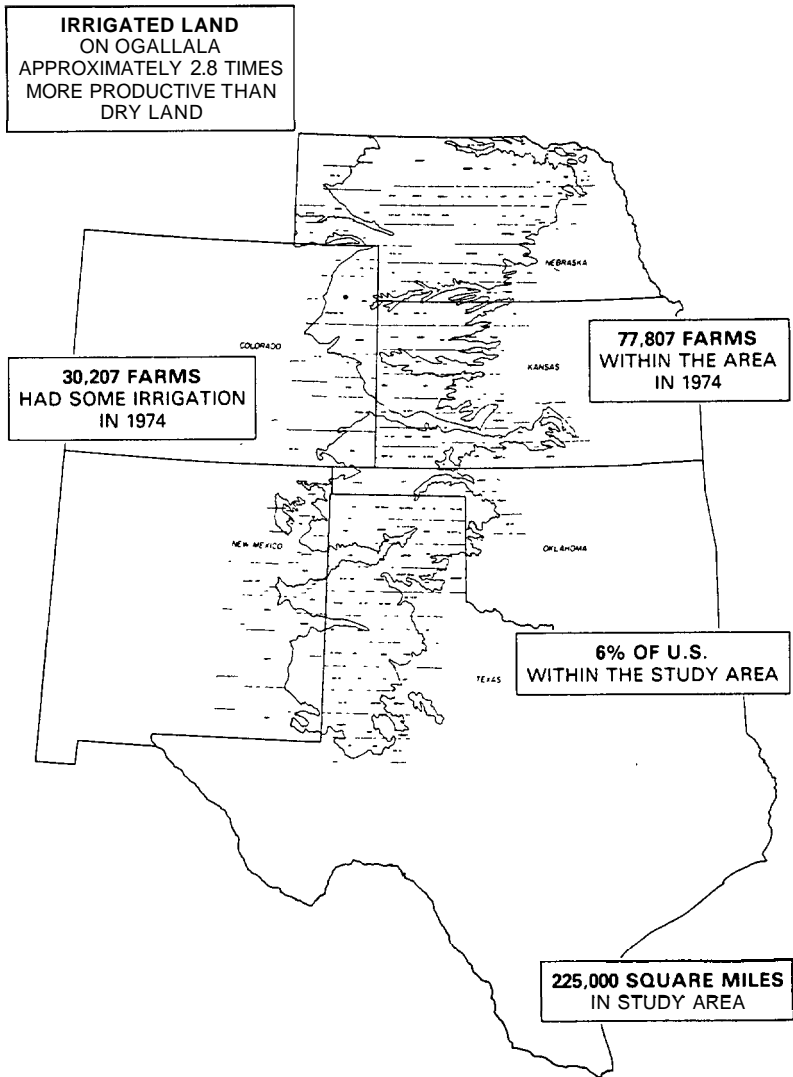


Figure 2
The Ogallala Aquifer and Study Area

will evaluate the effects of continuing existing trends and policies ("no action") and the effects of implementing each of the positive alternative development strategies on:

- the economy
- the environment
- the quality of life

The study will also determine:

- the costs of implementing each of the alternative development strategies
- the legal, institutional, financial, and organizational changes necessary to implement each of the positive alternative strategies
- the consequences of the "no action" option compared with the results of implementing positive action alternative development strategies

These study results will provide the High Plains Study Council, secretary of commerce, the Congress, state legislatures, and others an informed basis for reaching decisions as to the future of the High Plains-Ogallala Aquifer Region. Work by the general contractor must be essentially complete early in 1982.

It is planned to issue interim reports on the means, effects, and costs of applying advanced agricultural and water management technologies to achieve a more efficient use of water, and technologies for augmenting locally available water supplies and costs, during the first quarter of 1980. There are some measures that could be implemented early that would allow some degree of alleviation of the overdraft on the Ogallala Aquifer. A major interstate, interbasin project could not be completed and operational in less than twenty years.

Chart 1

HIGH PLAINS IRRIGATED CROPLAND

Millions of Acres

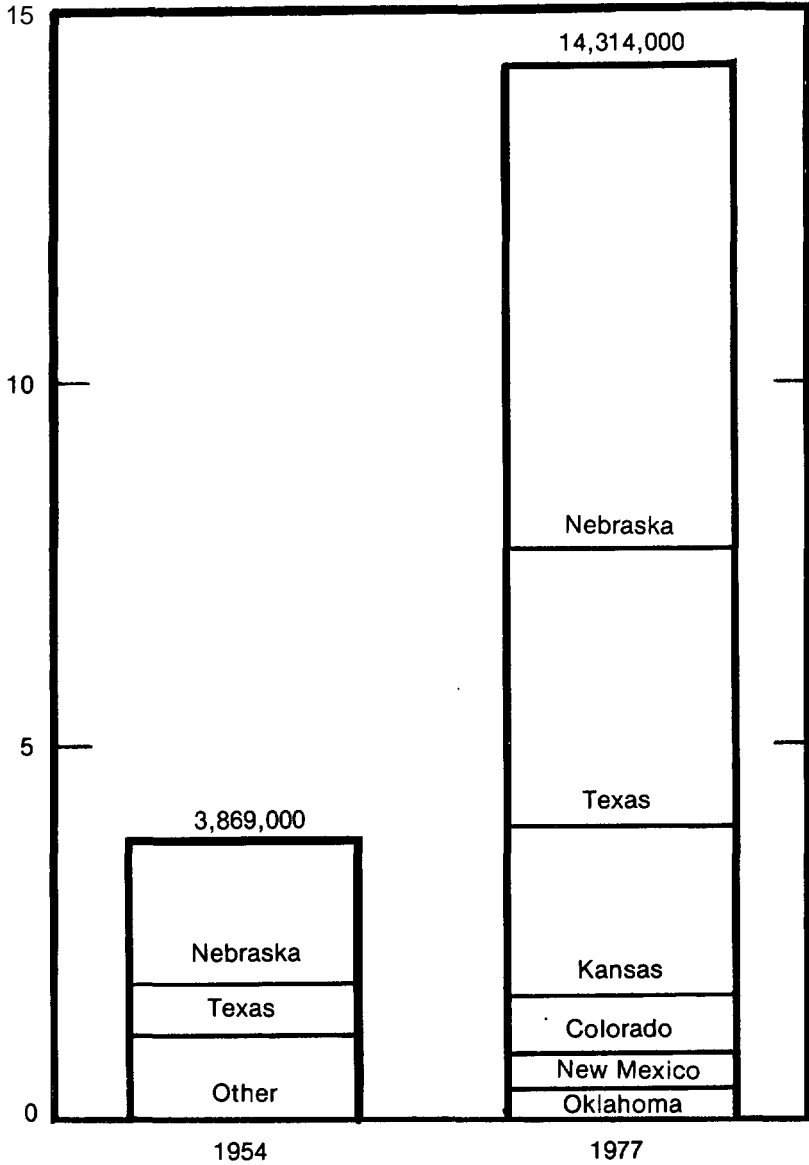


Chart 2
MAJOR HIGH PLAINS IRRIGATED CROPS

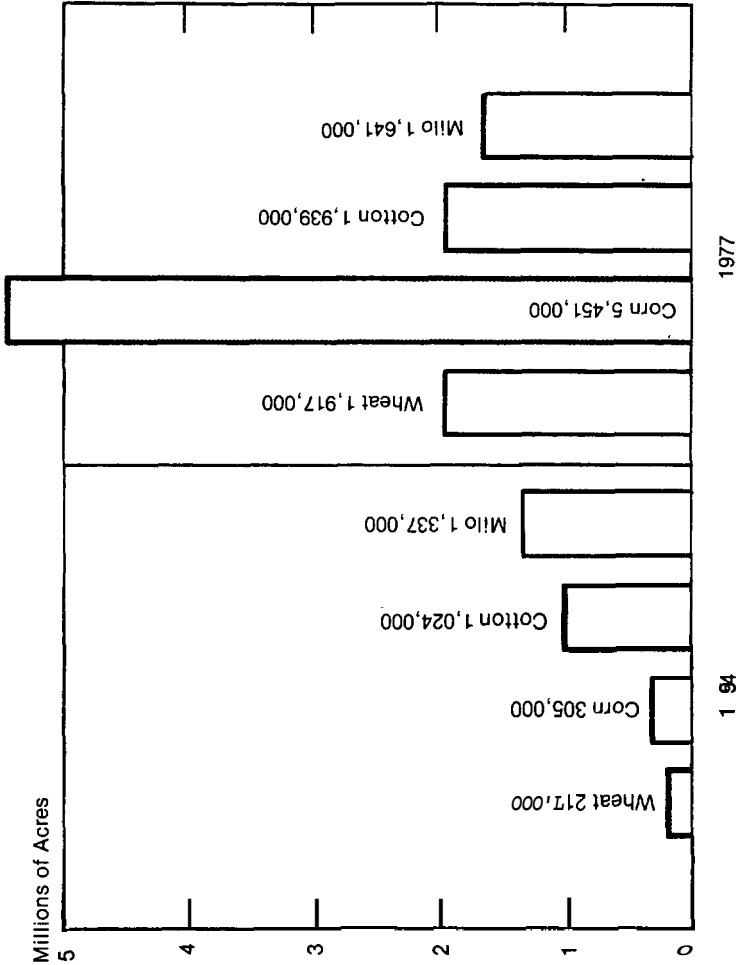


Chart 3
TYPICAL HIGH PLAINS CROP YIELDS 1977

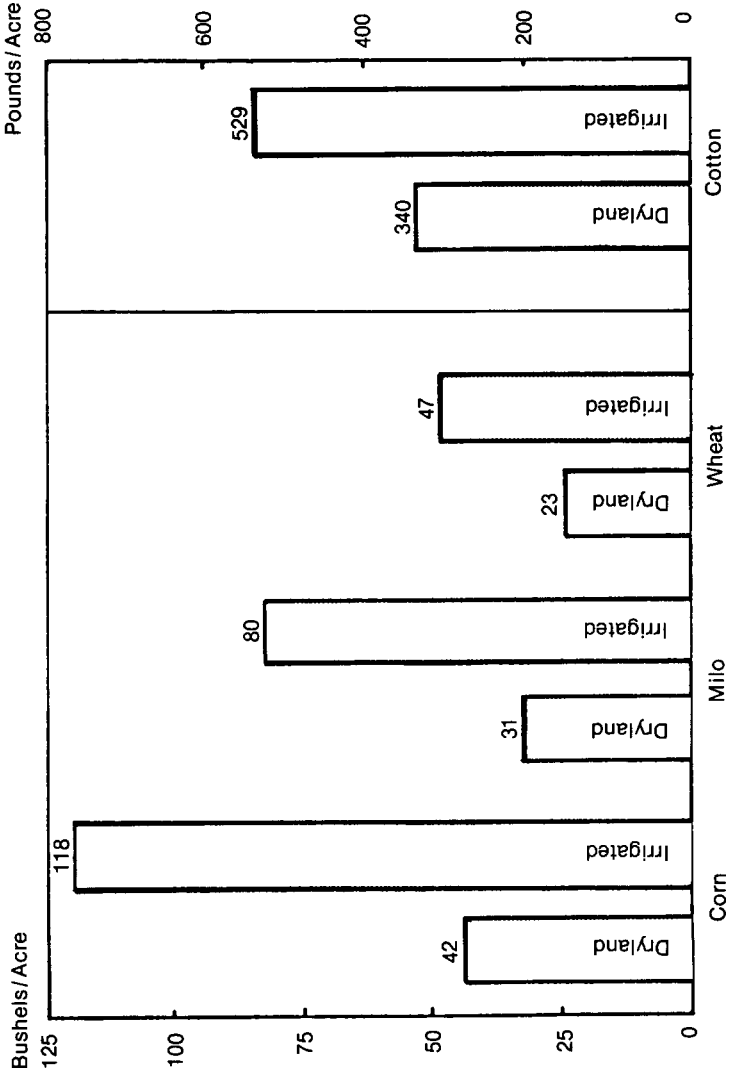


Chart 4
**VALUE OF EXPORT SHARE OF
TOTAL FEED GRAINS**

Billions of Dollars

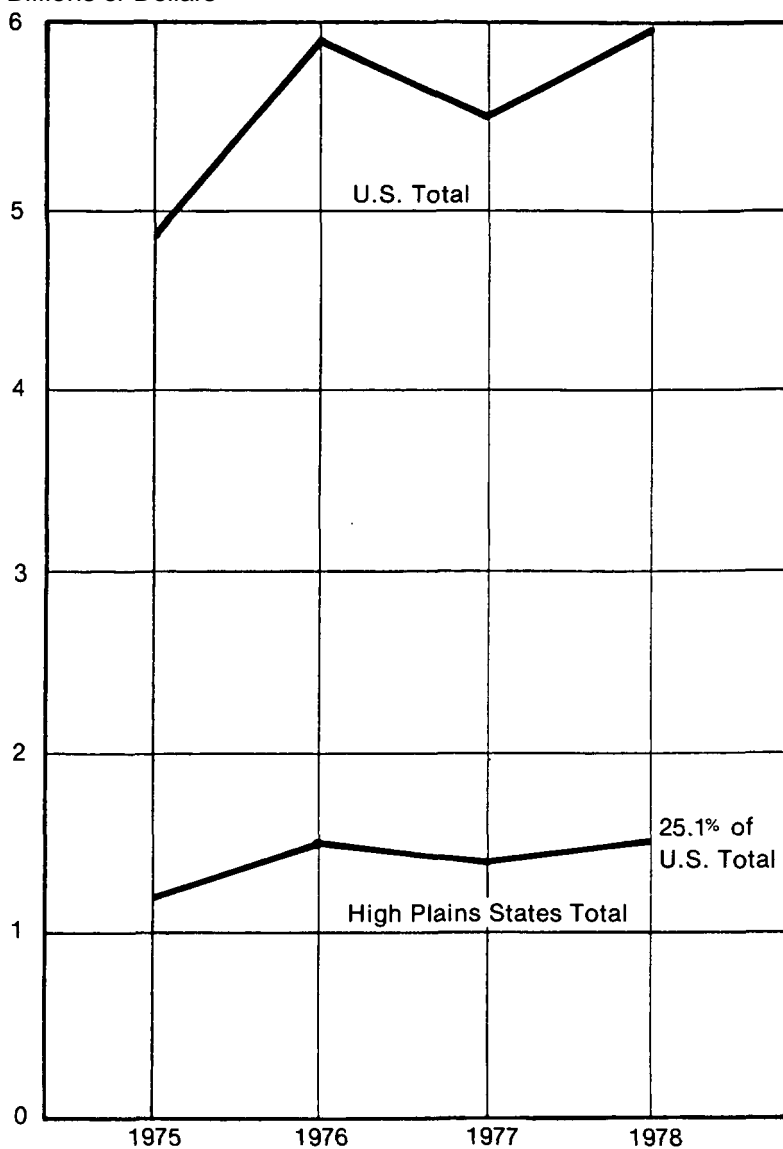


Chart 5
**VALUE OF EXPORT SHARES OF
WHEAT AND FLOUR**

Billions of Dollars

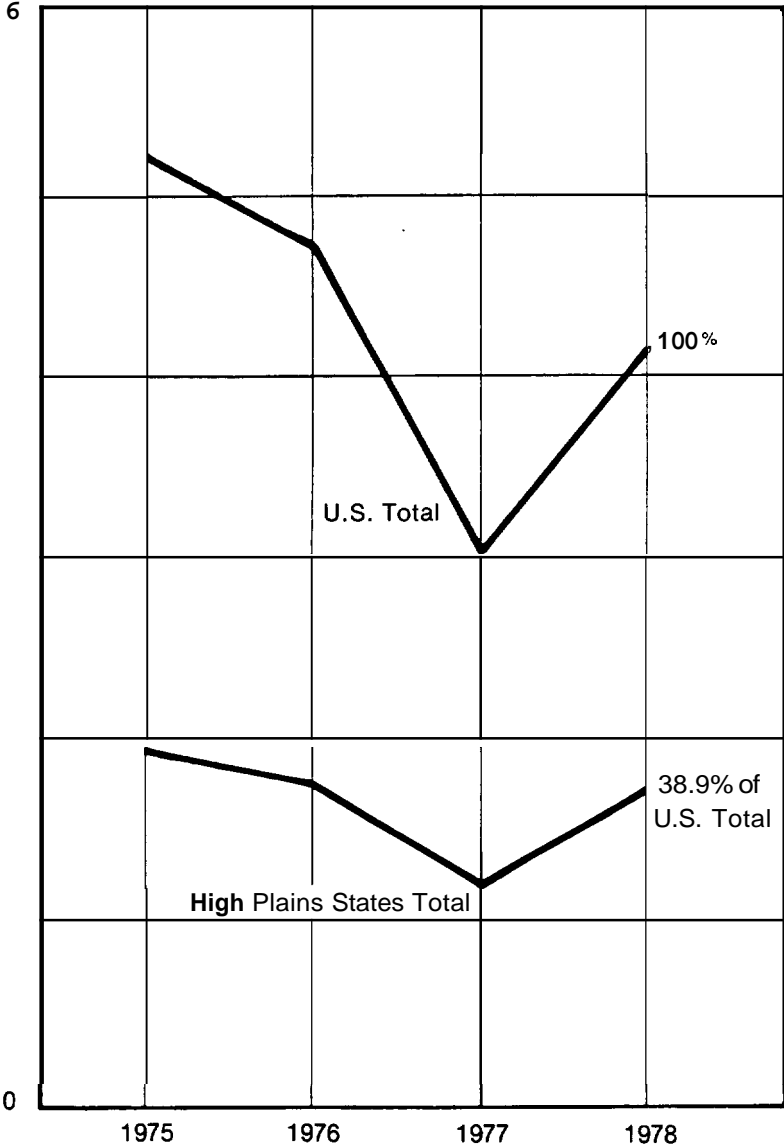


Chart 6
**VALUE OF EXPORT SHARES OF COTTON,
INCLUDING LINTERS**

Billions of Dollars

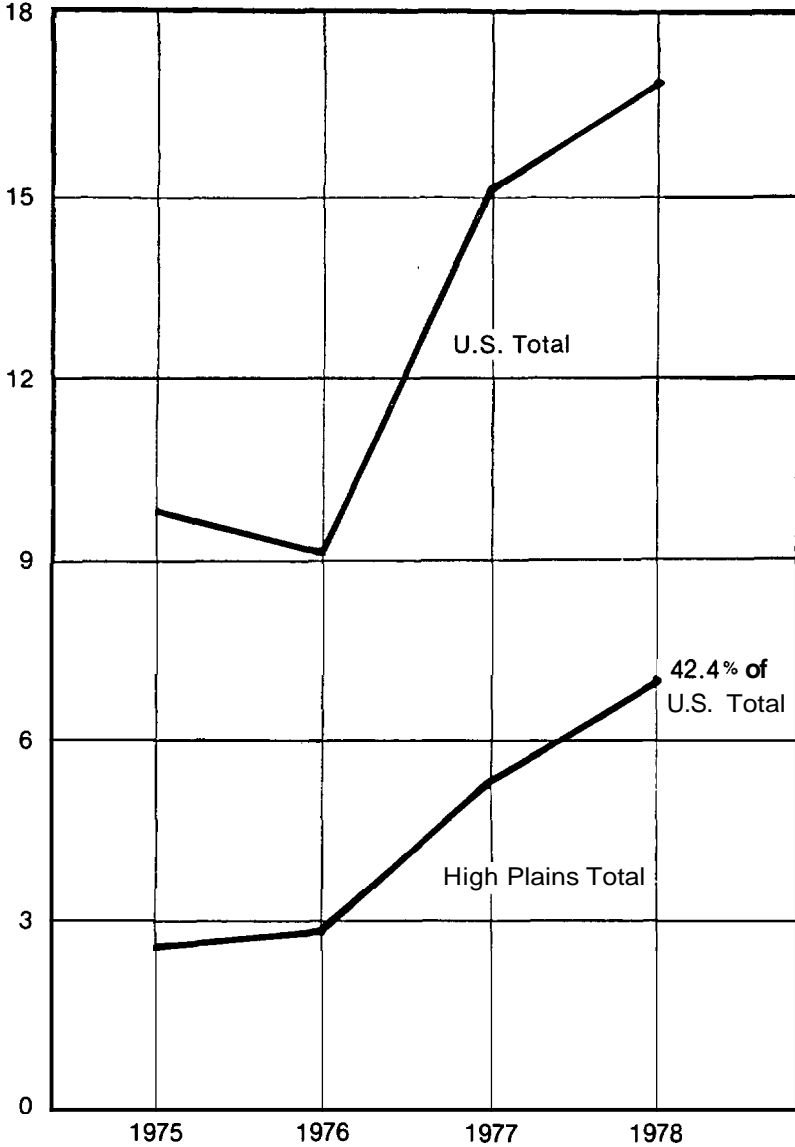


Chart 7

VALUE OF EXPORT SHARES OF ALL AGRICULTURAL COMMODITIES

Billions of Dollars

