IRRIGATION WATER NEEDS IN NEW MEXICO FOR THE NEXT HUNDRED YEARS

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What will irrigation farming be like a hundred years from now, or even in the year 2000? Almost certainly irrigation technology will preclude the crude practice of running water down furrows. Probably most crops will be solid planted and watered by sub-irrigation systems or sprinklers. In more humid areas the farmer may simply order a rain instead of relying on supplemental irrigation. Certainly developments at least this startling will have occurred by the turn of the century.

Perhaps irrigation, or even agriculture as we know it, will be obsolete by the year 2060. Our food may be drawn from the oceans or chemically synthesized. Our farmers may be producing for markets increasingly eroded by cheap manufactured substitutes. This prospect seems more likely than one of United States agricultural capacity under constant strain to feed a world population increasing at an exponential rate.

Water problems are high on the list of public concerns at present. Water supply and pollution problems have spread to the eastern states and become more critical in the West. The problems are of a scope and nature requiring state, interstate and federal planning and large public investments in water development programs.

Much interest has been directed to plans for importing water into southwestern states and communities. Importations appear to offer the only means for maintaining present levels of irrigation in pump irrigated areas. Other plans would permit continued irrigation development. The uncertain future of irrigation should cause us to consider carefully alternative plans for developing water resources and should tend to favor programs which develop water resources more gradually, in accordance with market demands, and commit public investments for shorter periods of time.

FACTORS AFFECTING FUTURE IRRIGATION IN NEW MEXICO

Projections of future irrigation water requirements must be based on a set of assumptions which concern those factors thought to be relevant or determining. A projection is not identical with but is related to a prediction. It is a prediction of what would occur at some future time

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if all the assumptions upon which the projection is based came about.

Among the factors that will determine future irrigation water needs in New Mexico are: (1) World population changes relative to food supply potentials and their implications for United States agricultural production, (2) Technological developments in food production and water developments, (3) Public policies as they relate to local areas and not necessarily related to the above, (4) Population growth and shifts in New Mexico and the United States.

World Population and Food Supplies

Population in the under-developed countries is increasing at the rate of 2.5 percent annually (1). The extent to which United States agriculture will be called upon to supply food deficits of under-developed countries has been the subject of speculation. Recent studies have indicated that United States agriculture has an abundance of land resources that could be rather readily converted to crop production (2). The 1958 Conservation Needs Inventory of land resources in the United States showed 422 million acres used for crops. Class I to IV land in this inventory is regarded as suitable for crop production and over 75 percent of the 806 million acres in these classes could be made available by corrective practices to control erosion and improve drainage.

The potential is considerably greater than this. The CNI is entirely inadequate as a basis for projecting the potential increase in irrigable acreage in the western states since climatic factors largely distinguish class I to IV land from that in higher classes. In New Mexico with a land area of nearly 77.8 million acres only about 5.8 million acres of class I to IV land was listed in the inventory of which 2.1 million acres was cropland (most of the remainder is range) (3). In most of New Mexico only the irrigated land is included in the arable classes due to the climatic variable of limited rainfall. Land in higher classes would be classed I to IV if irrigated. For example, in Dona Ana County 99,500 acres are included in classes I to IV of which 95,900 acres are irrigated. All but 2300 acres of the remaining 532,100 acres is class VII land. Another 1.8 million acres in Dona Ana county is in federal ownership and omitted from the inventory.

No irrigability classification of soils exists in New Mexico except for an initial effort by Dregne and Anderson for Curry County (4). They placed 94 percent of the land area of Curry County in irrigable classes I to IV and the remaining 6 percent in class V, non-irrigable. The Agricultural Economics Department of New Mexico State University is engaged in a study to evaluate the economic irrigability of land in New Mexico based on economic and climatic as well as soil variables.

Table I indicates the performance required by United States agriculture to supply world food needs in 2000 and 2060 assuming an extreme imbalance between population growth and food production in the under-developed countries. World population would increase from 3.4 billion in 1965 to 7.5 billion in the year 2000 and reach 30.4 billion by 2060. If the United States were to make up all the food deficits of the world, grain production would have to increase four times by the year 2000 and 24 times by 2060. This would require an annual rate of increase of 4 percent to the year 2000 declining to 3.4 percent in 2060. During the period 1955-65, agricultural production in the United States increased at a rate of nearly 2 percent, all as a result of increased yields or shifts in existing land use. Acreage declined slightly. The projections would require that yields continue to increase at least two percent each year and that crop land increase at the same rate until 2000 and somewhat less thereafter.

Public Policies

Decisions arrived at through the political process are often dictated by local desires and conditions and may be only remotely related to national and world conditions and pressures. Pavelis took account of this variable in projecting the long term growth of irrigation acreage in the 22 major water regions of the United States (5). He applied a complex statistical projection of historical rates of irrigation development that allowed irrigated acreage in each region to approach a maximum by the year 2000. The maximum in each region was the proportion of potentially irrigable land that the postulated irrigation policies would allow to be developed.

The potentially irrigable acreage was set by economic limitations. However, his study was limited by the lack of an irrigability classification of land that hampers other efforts. Moreover, the political limits were only assumed and had no analytical basis.

PRESENT IRRIGATION IN NEW MEXICO

The most recently published estimates of the acreages irrigated in New Mexico were prepared by the State Engineer Office and are reported by drainage basin in Table 2 (6). The most recent revision puts the 1965 irrigated acreage at 1,046,600.

In this paper the Rio Grande Basin was divided into north and south portions at the northern border of Sierra County. The western closed basins were combined with the Lower Colorado River Basin. The location of the drainage basins is shown in Figure 1.

Table 1. United States and world population and grain production, 1965 and projections to 2000 and 2060

	World Population						
	1965a/			2000		2060	
	Total	Percent of total	Percent Annual Increase	Total	Percent of total	Total	Percent of total
	(millions)			(millions)		(millions)	
Less Developed Countries	2,600	70.0	2.5	6,170	82.0	27,130	89.2
Developed Countries except United States	610	24.4	1.5	1,030	13.7	2,510	8.2
United States	190	5.6	1.5	320	4.3	780	2.6
World Total	3,400	100.0	---	7,520	100.0	30,420	100.0

	World Grain Production (tons)										
			1965a/			2000			2060		
	Per Capita Consumption	Percent Annual Increase	Total	Percent of total	Imports	Total	Percent of total	Imports	Total	Percent of total	Imports
	(tons)		(millions)		(millions)			(millions)	(millions)		(millions)
Less Developed Countries	.171	1.0	424.5	43.8	20.5	599.9	31.0	455.2	1,092.1	16.1	3,547.1
Developed Countries except United States	.636	1.5	368.4	38.0	19.7	620.5	32.1	33.6	1,516.9	22.4	79.5
United States	.705	B*	176.0	18.2	-42.1	714.4	36.9	-488.8	4,176.5	61.5	-3,626.6
World Total			968.9	100.0	- 1.9	1,934.8	100.0	0	6,785.5	100.0	0

*B is percentage annual rate of increase of United States production to satisfy world food needs and is 4.1 percent in the year 2000 decreasing to 3.4 percent in the year 2060.

a/ Source of figures: Heady, E. O., Mayer, Leo V., and Ball, A. Gordon. "Trends and Capacity of U. S. Agriculture", paper given at conference sponsored by the Center for Agricultural and Economic Development, Iowa State University, Oct. 2-4, 1967.

Table 2. Acreage Irrigated and Source of Water Used in New Mexico by Drainage Basins, 1960-64.1/

	Acres Irrigated			
	Surface Water	Ground Water	Surface and Groundwater Combined	Total
Arkansas River	95,130	4,530	-	99,660
Southern High Plains	-	288,200	-	288,200
Pecos River	39,520	124,405	32,935	196,860
Central Closed Basins	3,070	28,440	1,000	32,510
Rio Grande	132,590	18,825	105,030	256,445
Western Closed Basins	-	160	-	160
San Juan River	51,000	-	-	51,000
Lower Colorado River	12,280	3,930	5,450	21,660
Southwestern Closed Basins	215	53,220	1,000	54,435
TOTALS	333,805	521,710	145,415	1,000,930

1/ Source: New Mexico State Engineer Office, "Water Resources of New Mexico," State Planning Office, Santa Fe, 1967.

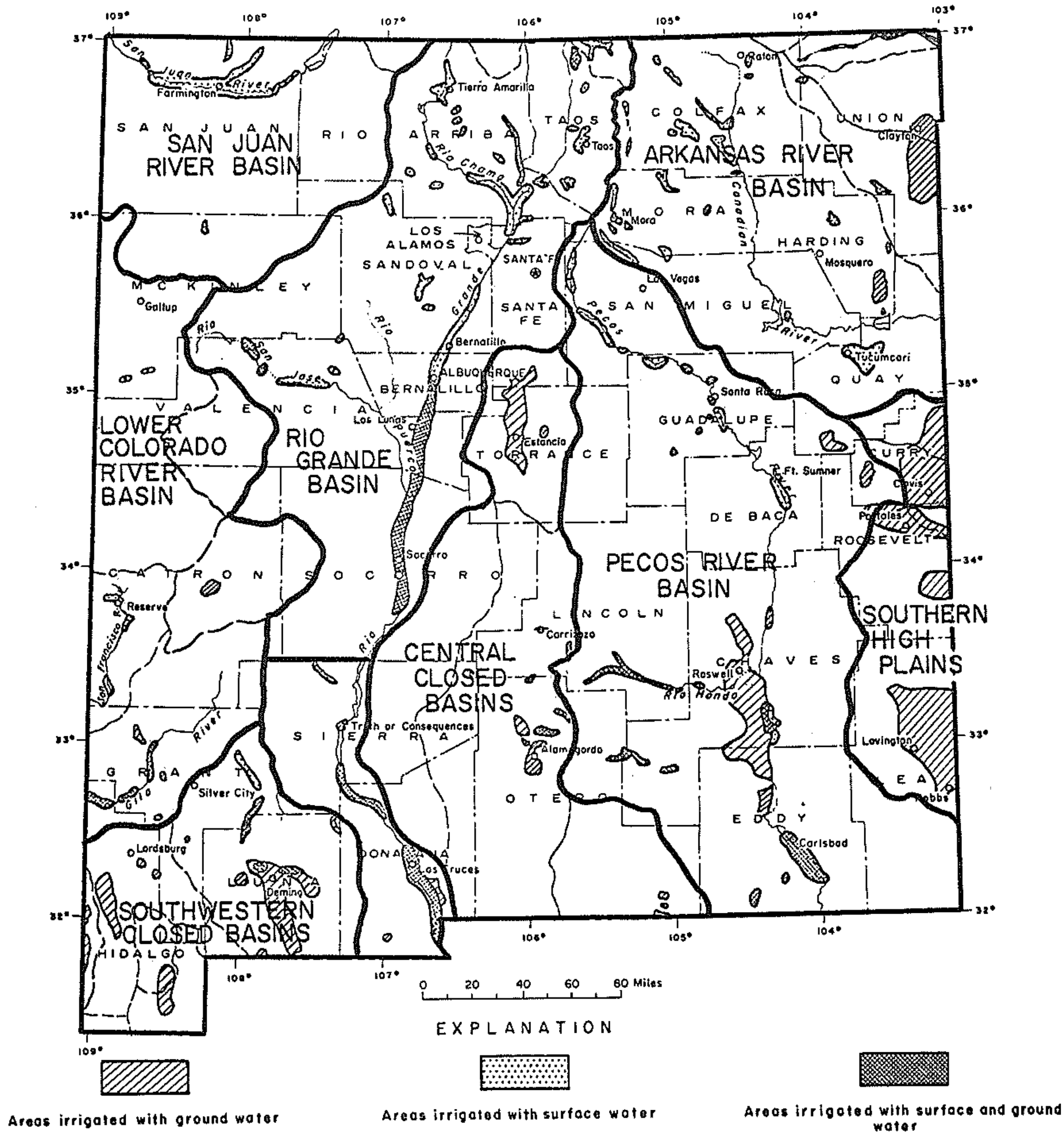

Figure 1. Drainage Basins in New Mexico and Irrigated Areas by Source of Supply, 1965.

Irrigation development in recent years has increased most rapidly in the southern High Plains Basin, particularly in Curry County (Table 4). Pump irrigation development is continuing in the southwest closed basin, especially in southern Hidalgo County. Significant irrigation development is underway in the Arkansas River Basin. In contrast, development in the Pecos River Basin and Rio Grande Basin is relatively static.

The Navajo Indian Irrigation Project will make 250,000 acre-feet available for irrigation in the San Juan Basin. At present rates of diversion, irrigated acreage could more than double. The San Juan-Chama project, also under construction will provide 29,900 acre-feet for irrigation in the Rio Grande Basin in northern New Mexico and 22,600 acre-feet for supplemental irrigation in the Middle Rio Grande Conservancy District (6).

Table 3 shows the irrigated acreages of principal crops in each drainage basin in 1966 as reported by the Crop Reporting Service. Gross value of crop production per acre was calculated for each basin.

PROJECTED WATER USE FOR IRRIGATION

High, low and medium projections of irrigated acreage and water requirements for irrigation were made to the years 2000 and 2060. The temptation to make any of these projections - particularly the medium projection - a prediction was scrupulously avoided.

High Level of Irrigation Use

The assumptions which result in the high projection of irrigation in New Mexico are not those likely to be responsible should the projection actually occur. It is more probable that irrigation in the magnitude of nearly eight million acres projected for 2060 would come about rather soon, say within 30 years, or not at all, and would be the result of political pressures that put through large water developments such as those being presently proposed. However, the assumptions used here merely remove any political or legal obstacle to increase irrigation development resulting from the forces described below.

Assumptions for the high projection. The high projection is consistent with the following assumptions: (1) World population will continue to increase at the present high rate of 2.3 percent annually. (2) United States agricultural production will increase at a rate to supply world food deficits. Transportation and distribution facilities will make the demand effective. Production increases in New Mexico will keep pace with or exceed the United States rate. (3) Water is available for importation into New Mexico or transfer within New Mexico at approximately the same relative costs (including land preparation and diversion systems) as at present.

Table 3. Acreage and Gross Value Per Acre of Principal Irrigated Crops by Drainage Basin, New Mexico, 1966.

Drainage Basin	Irrigated Crop Acres, 1966									Gross Value per Acre (Dollars)
	Cotton	Small Grain	Corn and Sorghum1/	All Hay	Vegetables	Dry Beans	Peanuts	Pecans and Apples2/	Total	
Arkansas River	1,190	6,400	18,170	50,100	0	20	60	65	76,005	44
Southern High Plains	25,170	69,690	120,310	18,100	970	340	8,140	-	242,720	98
Pecos River	43,425	7,680	7,860	88,100	95	160	0	1,225	148,545	153
Central Closed	1,280	1,070	1,400	6,600	1,760	1,100	0	-	13,210	155
South Rio Grande	46,085	2,800	2,700	16,200	7,710	20	0	6,005	81,520	285
Southwestern Closed	13,810	2,350	26,550	5,100	275	1,510	0	105	49,700	151
Lower Colorado River and Western Closed	25	700	850	5,500	0	0	0	180	7,255	66
San Juan	0	650	3,000	14,400	0	250	0	800	19,100	88
North Rio Grande	1,285	5,660	4,960	59,900	1,490	300	0	1,785	75,380	90
STATE TOTAL	132,270	97,000	185,800	264,000	12,300	3,700	8,200	10,165	713,435	
Gross Value Per Acre (Dollars)	226	80	78	85	889	73	258	377		128

1/ Includes broomcorn

2/ Additional Source: New Mexico Crop and Livestock Reporting Service, "New Mexico Apples and Pecans", New Mexico Department of Agriculture, New Mexico State University, October, 1963.

Source: New Mexico Agricultural Statistics, Vol. VI, Las Cruces, New Mexico, June, 1967.

Computations were made assuming that irrigated acreage will continue to increase at the same annual rate as in the 1955-65 period. The rate was weighted toward the most recent five-year period by averaging the annual increase from 1955-65 and from 1960-65. Separate rates were calculated for each drainage basin and are presented in Table 4. However, the rate of increase for the entire state of 2.14 percent per year, was applied to the 1965 irrigated acreage of each basin.

Irrigated acreage more than doubled between 1965 and 2000 and increased 7.4 times by 2060. The increase in acreage calculated for each basin was adjusted by the ratio of the 1966 gross value of crops per irrigated acre in the basin divided by the same figure calculated for the state. Thus the projected 2000 and 2060 irrigated acreages in each region reflected the 1955-65 rate of increase in the state and the value or productivity of water in each region. The latter assumes that gross value is related to the net return per acre and to the marginal value product of water.

Location of production. Projected irrigated acreage in each basin is shown in Table 4. The areas of lowest value irrigation received the smallest increase, notably the Arkansas River Basin and Colorado River Basin. Irrigated acreage was projected to increase three times and four times, respectively. The largest increase was in the southern portion of the Rio Grande Basin where irrigated acreage would increase from about 100,000 in 1965 to over 1.5 million in 2060. Rather large increases of about nine times the present acreage would occur in other southern regions.

Radically different values would have resulted if the rate of change within a basin had been the basis for projecting irrigation development. Development in the Rio Grande and Pecos basins would have been nearly stationary. Since irrigable land appears to be abundant in all areas, the assumptions of plentiful and reasonably priced water supplies should allow for irrigation development in each basin, to the extent that it is profitable.

Water uses. Water diversions were assumed to increase at the same rate as irrigated acreage, but depletions increased per acre and as a percent of diversions. This reflected increased consumptive requirements for rapidly increasing crop yields and greater irrigation efficiency which allowed per acre diversions to remain constant.

The projections reflect the increase in irrigated land and water requirements to allow New Mexico agriculture to maintain its share of United States production. The projected water requirements are presented in Table 5. Depletions for irrigation in New Mexico were 1.7 million acre-feet in 1965 and diversions were nearly 3.2 million acre-feet. Under the high projected

Table 4. Acres Irrigated by drainage Basin in New Mexico 1955-65 and Projections to 2000 and 2060: High Level of Water Use.

Drainage Basin	Acres Irrigated 1/			Annual 2/ Rate of Increase	Projected Acres Irrigated 3/	
	1955	1960	1965		2000	2060
	(000)	(000)	(000)	(Percent)	(000)	(000)
Arkansas River	77.5	87.0	98.7	2.46	135	319
Southern High Plains	209.0	244.0	326.0	5.26	601	1,949
Pecos River	192.5	196.3	195.9	0.08	454	1,718
Central Closed	26.0	29.3	31.5	1.75	74	279
South Rio Grande	95.6	97.8	99.1	0.31	342	1,534
Southwestern Closed	50.7	58.2	68.8	3.25	158	596
Lower Colorado River and Western Closed	15.1	12.2	18.1	4.50	28	79
San Juan	42.5	47.6	50.5	1.50	109	381
North Rio Grande	168.0	151.0	158.0	-0.40	280	880
STATE TOTAL	876.9	923.7	1,046.6	2.14	2,181	7,735

1/ Estimates still under revision by the State Engineer Office, State Soil Conservation Service, New Mexico Agricultural Experiment Station, and United States Bureau of Reclamation.

2/ Calculated as the average of the 1955-65 and 1960-65 annual rates of increase.

3/ Acreage irrigated in each basin in 1965 was increased at the annual rate of increase in New Mexico of 2.14 percent and projected to the years 2000 and 2060. The increase in acreage for a basin was adjusted by the ratio of gross value per acre irrigated in the basin to the average gross value per acre irrigated in the state. Crop values for 1966 were from New Mexico Agricultural Statistics, June 1967.

Table 5. Water Diversions and Depletions for Irrigation by Drainage Basin, 1965 and High Projections to 2000 and 2060.

Drainage Basin	1965 Water Depletions[1] (1000 Acre-feet)	1965 Water Diversions[1] (1000 Acre-feet)	Water Depletions[2] (1000 Acre-feet)		Water Diversions[3] (1000 Acre-feet)	
			2000	2060	2000	2060
Arkansas River	132.8	232.8	194	565	318	753
Southern High Plains	406.7	637.2	716	2,858	1,174	3,810
Pecos River	370.9	662.9	937	4,359	1,536	5,812
Central Closed	52.2	79.1	112	524	184	698
South Rio Grande	230.1	483.8	1,017	5,610	1,668	7,483
Southwestern Closed	132.4	220.8	309	1,432	506	1,909
Lower Colorado River and Western Closed	32.3	55.4	53	181	87	241
San Juan	94.0	179.2	237	1,016	388	1,354
North Rio Grande	284.5	615.8	667	2,574	1,093	3,432
STATE TOTAL	1,735.9	3,167.9	4,242	19,119	6,954	25,492

1/ Source: New Mexico State Engineer Office, "Water Resources in New Mexico: Occurrence, Development and Use," State Planning Office, Santa Fe, 1967.

2/ It is assumed that water depletions, which averaged 54 percent of water diversions in 1965, will have increased to 61 percent by 2000 and 75 percent by 2060 due to increased efficiency of diversion and irrigation and due also to greater consumptive use per acre as the result of an assumed 2 percent annual increase in crop yields.

3/ Water diversions are assumed to remain at the 1965 per acre level. Water requirements per acre have increased due to increased per acre yields, but increased efficiency of diversion and application balances this.

use irrigation depletions would increase to over 4.2 million acre-feet in 2000 and 19 million acre-feet by 2060. Diversions would increase 1000 percent as an average for the state compared to a 670 percent increase in acreage. Nearly the entire increase in depletions above present levels would have to come from importations to the state.

We might compare the magnitude of these high projected water requirements with development projects such as NAWAPA and the west Texas plans. The former proposed to provide 10 million acre-feet to New Mexico annually, mainly to the Arkansas River, Pecos River, Rio Grande below Caballo Reservoir and the southwestern closed basins. The west Texas plans would provide water to the southern High Plains Basin of New Mexico where irrigable land area has been estimated at about 10 million acres.

Low Level of Irrigation Use

The factors which combine to cause large water requirements for recreation and municipal-industrial uses may result in low requirements and/or availability of water for irrigation. Rapid population growth that augmented the demand for New Mexico (United States) agricultural products, if accompanied by continued prosperity in this country, would increase all demands for water. If water rights were freely marketable, water would be purchased from agriculture for these other uses. If population grew more rapidly than our ability to feed ourselves and the world, the value of water for irrigation would increase relative to other uses.

Rising per capita incomes increase the demand for recreation and most industrial products more rapidly than for agricultural products.

Assumptions for the low projections. The low projected use of irrigation water might be the result of technological obsolescence or lack of demand for agricultural products as described earlier. This possibility is ignored and the following assumed: (1) Population in New Mexico will grow at a rapid rate compared to the moderate rate of increase in the United States. (2) Water supplies are limited to presently known and economically available quantities. (3) Legal institutions (water laws and public policies) prevent importations or transfers from the area of origin. (4) Recreation and municipal-industrial uses, being of higher value, can and will purchase from agriculture the amounts of water desired.

The assumptions are not entirely compatible. Economic activity in many New Mexico communities is directly related to the growth or decline of agriculture. Prosperity and rapid population growth would be difficult to maintain if diminishing water supplies caused irrigation to decline rapidly. Neither are the assumptions the most extreme that could be postulated.

New Mexico population was not a consideration in the high projection. Edgel's population projection for New Mexico counties to the year 2000 was the basis for projecting irrigated acreage in each drainage basin in the low projection (8). According to this projection, New Mexico's population would increase from 951,000 in 1960 to 2,778,000 in the year 2000, an annual rate of increase of about 2.7 percent.

For the purposes of this study, the rate of population growth after 2000 was assumed to decline so that New Mexico population reached 6 million by the year 2060.

All available surface and groundwater in New Mexico is assumed to be fully appropriated and no additional irrigation development is permitted. Irrigation is the residual user after all other uses are satisfied. Possible reductions in nonbeneficial uses are not considered. Groundwater mining will continue until physical or economic limitations reduce depletions to a balance with recharge. Where surface and groundwater sources are commingled water depletions are maintained at a level that balances the basin. The results are given in Table 6.

Location and amounts of irrigation. The low projection indicated a decline in irrigated acreage of 40 percent by the year 2000. Irrigated acreage and water depletions would decline to a third the 1965 level by 2060. Both areas of high and low value crop production experienced equally sharp declines. This was a consequence of the assumptions for the low projection.

The complicated hydrology of New Mexico water basins prevented reliable estimates of groundwater recharge. Some information is available for bold estimates. The remaining saturated depth of acquifer was compared to the rate of decline in water level in projecting the irrigated acreage remaining in 2000 and 2060. The rate of mining was assumed to decrease over time as wells went out of production and pumping quantities decreased. The effect was to prolong the life of the acquifer.

Pump irrigation on the southern High Plains would virtually cease by 2000. Pumping from the extremely deep acquifers of Luna and Hidalgo counties might be prolonged for a longer period.

Nonirrigation uses were responsible for the decline of irrigation in the northern Rio Grande Valley. Population was projected to multiply ten times throughout the Rio Grande Basin by 2060.

Medium Level of Irrigation Use

The medium level of water use assumes that conditions remain much as at present. This will require a moderate amount of development of water supplies

Table 6. Acres Irrigated, Water Depletions and Water Diversions for Irrigation by Drainage Basin, 1965, and Projections to 2000 and 2060: Low Level of Water Use.

Drainage Basin	Acres Irrigated			Water Depletions (1000 Acre-feet)			Water Diversions (1000 Acre-feet)		
	1965	2000	2060	1965	2000	2060	1965	2000	2060
	(1000)	(1000)	(1000)						
Arkansas River	98.7	99	99	132.8	133	133	232.8	233	233
Southern High Plains	326.0	50	0	406.7	62	0	637.2	98	0
Pecos River	195.9	118	62	370.9	221	117	662.9	395	209
Central Closed	31.5	21	16	52.2	30	22	79.1	48	37
South Rio Grande	99.1	82	47	230.1	190	108	483.8	440	250
Southwestern Closed	68.8	30	2	132.4	58	4	220.8	111	7
Lower Colorado River and Western Closed	18.1	18	18	32.3	32	32	55.4	55	55
San Juan	50.5	50	50	94.0	94	94	179.2	179	179
North Rio Grande	158.0	147	16	284.5	264	9	615.8	570	194
STATE TOTALS	1,046.6	615	310	1,735.9	1,084	519	3,167.9	2,129	1,164

to recharge groundwater tables in pump irrigated areas. The Navajo Indian Irrigation Project and irrigation under the San Juan-Chama Diversion are included in projections of irrigated acreage. This was the only expansion of irrigated acreage included in the projection.

Assumptions for the medium projection. The medium projection is based on the following assumptions: (1) The population-food supply balance in the world does not become critical. As a result there is a moderate increase in demands for irrigation water and agricultural products. Agricultural production in the United States will continue to increase without an increase in acreage. (2) Presently unappropriated water will be developed and water importations will permit irrigation to continue at present levels or increase sufficiently to allow New Mexico agricultural production to keep pace with the moderate world population growth. (3) There are no institutional restrictions on water transfers.

A medium projection based on these assumptions takes advantage of data developed for the high and low projections of irrigation water needs. It provides a rough estimate of the magnitudes of water importations needed to maintain present irrigation developments in each basin and still permit population and other water uses to increase rather rapidly. Increased water requirements for nonagricultural uses are those developed for the low projection and based on Edgel's population projections for New Mexico.

Water requirements of the medium projection. The results of the medium projection are in Table 7. Irrigated acreage and water depletions were assumed to remain at 1965 levels for the next hundred years. No shifts were projected between regions. The exception was in the San Juan and Rio Grande Basins. The Navajo Indian Project and San Juan-Chama Diversion were assumed to be completed and water allocated as proposed. A rather slow rate of development was assumed that did not immediately or fully utilize the large water supplies. Some of this water, in addition to the maximum 235,000 acre-feet scheduled to be diverted to the Rio Grande Basin, was used to alleviate the pressing water problems of that region.

The medium projection indicated that given the present uses of water in New Mexico an additional 590,000 acre-feet would be needed in 1965 to maintain groundwater levels with the largest requirements in the southeastern High Plains, Pecos River and southwestern closed basins. The projected increase in other uses, associated with the growth in population, would require supplemental supplies of water in the Rio Grande Basin before the year 2000.

By the year 2060 other uses would far outweigh agriculture as important users of water. Included in the total depletion figures of Table 7 are nonbeneficial depletions and evaporation from reservoirs which distort the magnitudes of

Table 7. Water Depletions and Importations Needed to Maintain Irrigation in New Mexico and Satisfy Nonirrigation Use: Projection of Medium Water Use to 2000 and 2060.

Drainage Basin	Projected Irrigation (1000 Acres)	Irrigation Depletions (1000 Acre-feet)	Total Depletions (1000 Acre-feet)1/			Water Importations (1000 Acre-feet)		
			1965	2000	2060	1965	2000	2060
Arkansas River	99	133	250	270	300	0	0	0
Southern High Plains	326	407	450	480	550	310	340	410
Pecos River	196	371	650	710	810	90	150	250
Central Closed	32	52	110	120	140	60	70	90
South Rio Grande	99	230	650	690	830	0	(40)	(190)
Southwestern Closed	69	132	150	170	210	130	150	190
Lower Colorado River and Western Closed	18	32	50	60	60	0	0	0
San Juan2/								
(1) Present (1965) Irrigation	50	94	250	460	490	0	(-190)	(-390)
(2) San Juan and Navajo Projects	100	191						
North Rio Grande	158	284	760	910	1,250	0	(150)	(490)
STATE TOTAL	1,147	1,926	3,320	3,870	4,640	590	710	1,230

1/ Total depletions for each basin are estimates found in "Water Resources of New Mexico," op.cit., and were adjusted to the 1965 acreages in Table 4 of this manuscript.

2/ The San Juan Basin is projected to be a net exporter to the Rio Grande Basin, nearly to the extent of its needs. Since the San Juan and Navajo Indian projects are currently under construction, the water supplies are included in the projections to 2000 and 2060.

nonagricultural uses. However, these two types of depletion were assumed to remain at the same level over time so that comparisons for other uses may be made.

CONCLUDING REMARKS

The projections have very little analytical content and employ the simplest types of projection techniques. Projections of 50 or a hundred years, especially in such an unpredictable area as this, is an exercise in futility. However, planning is essential in any undertaking involving investments. An unavoidable first step in planning the development of water resources is making projections of the future. There would appear to be merit in attempting to develop water resources piece-meal rather than on a grandiose scale. A major obstacle has been the inability or unwillingness to consider alternatives.

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