

WATER USES FOR THE NEXT HUNDRED YEARS
A Summary Statement

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I would first like to compliment each of the three speakers for their papers and their attempts at making some projections into a time period that defies the imagination. Each paper develops a line of reasoning that brings at least into a "fuzzy" focus an idea of the magnitude of potential water uses and needs a hundred years from now.

As we stated in the preface remarks for this panel discussion, the objective here was to attempt an estimate of the future under a series of stated assumptions as to the direction of change in the future. Quite obviously none of us here today will be here in 2060 (although I am not absolutely sure even about that) to check on the accuracy of these projections. Others - many others, will continue to examine the changes as they occur and restructure projections based on new knowledge.

It would be possible at this point to start my summary statement by listing a number of uncertainties about the shape of world affairs - present and future - but our crystal ball is even less clear on these matters. I also have the problem of how to approach the task of summarizing uncertainties. Suffice it to say, however, that -

1. Population will continue to increase at breakneck speed at least to the year 2000. Only hopefully can we say progress of science and man will slow birth rates to a level commensurate with our ability to feed ourselves. Estimates of arable land in the world on a per capita basis in 1960 were 1.2 acres and by 2000 this will have been reduced to .48 with a population of 7.4 billion people. A generalized projection at these rates would mean less than 0.1 acre per capita by 2060. Only about five percent of the earth's surface is suitable for agricultural production.

2. The United States will be forced to make major contributions to starving populations around the globe where at present the fertility of the people is outstripping the fertility of the soil. These contributions will be in the form of actual food aid and technological assistance. FAO reports a yearly decline in per capita world food production. It is estimated that 10,000 people starve to death daily in a world where two of every three persons are undernourished even at the minimum nutritional levels. We now have food deficits of gigantic proportions. World grain needs of 770 million tons even in 1980 exceeds current production by more than 300 million tons. This problem simply will not

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just go away and the United States cannot fill the food gap from its own production. Increased per capita food production is an absolute necessity. By 2000, we will have three billion malnourished and starving people instead of 1.5 billion as we have today, unless per capita food production is increased. The social pressures created under such circumstances are inconceivable. The race is on! A race that cannot be won at current production rates - be it of people or food. We are on a collision course!

3. Food aid requirements plus meeting food demands at home will require vast increases in food production. We will not be able to ignore world population - food imbalances.

I have set this general stage with the backdrop of a picture of population and food balance problems because it seems to me that it is highly important that any projection about the future of New Mexico be made at least with some attention given to how New Mexico might be affected from such external forces.

THREE COURSES

We have heard projections for New Mexico that would indicate a population of six to twenty-two times present numbers, and employed so as to achieve higher incomes creating demands for vast increases in water for MD & I, recreation, and in agriculture. If I have been able to assemble these estimates properly, we will require no less than seven times as much water in 2060 as we now have in New Mexico. MD & I uses are projected to increase to a depletion requirement of about one million acre-feet, and recreation uses for seepage and evaporation losses alone without considering impounding requirements will require about 2.3 million acre-feet. As a bench mark these two uses alone total 3.3 million acre-feet which is almost identical with the current total depletions under all uses in the state of 3.25 million acre-feet. A dismal view then would be that if the state moves as Hernandez and Gray "imagineered" it, irrigated agriculture will have passed into the history books unless additional water supplies are provided or significantly greater accomplishments are made in efficiency of water use - in all use categories. Technology will solve part of the problem but certainly not all of it.

Now before someone concludes that this will be the situation in 2068, let me hasten to develop my second course of action that would reverse the above. Since all we can do is put some rather broad parameters around what the future may hold, we are obligated to present the view that agriculture could well be the highest bidder for the majority of total water supplies regardless of

their sources due to pressing population-food problems. Many varying views are available today as to the likelihood of such a situation but it is still one of the possibilities, like it or not - believe it or not.

A third possibility that should get consideration would be that New Mexico use its water resources for industrial and recreational development if it can be reasonably determined that agricultural production will in fact shift to areas with greater comparative advantage. This assumes an affluent population and food technological developments that reduce farming to a nonessential in New Mexico.

Needless to say, I am only speculating from points made in the three papers and taking a few liberties at that. Yet it is obvious that if developments occur as outlined by the three speakers for 2060 that competition for available supplies of water will be more than keen. It would further seem obvious that if supplies of water are to be adequate to permit maximum development in all use categories, additional water supplies will have to be provided. All speakers at this Conference appear to have been in agreement on this point. It would be also concluded that we will need to give much consideration to the need for and basis of establishing priorities on our uses of water.

We are facing a challenging dilemma. To achieve higher per capita income, industrial development on a greatly increased scale must be stimulated. People with higher incomes have increased demand for water for both municipal and recreational uses. Increased population gives rise to greatly increased demand for food and thus increased demand for water in farming.

Assuming existing or decreasing supplies of water in the future, New Mexico has some decisions to make. Will the need for food force us to use our water for production on farms or will comparative advantage push New Mexico toward industrialization at the expense of farming? Under varying sets of assumptions, answers will reveal the direction of change. We must be prepared to take some hard looks at alternative future prospects and attempt to bring about the changes that make for a better New Mexico. That planning must start now.

If we plan for an abundant supply of water, New Mexico can be a major industrial state, a recreationist's paradise and have a farming industry irrigating at least eight times as many acres as today. This you may conclude is also an optimist's view but it need not be.

On the other hand, if we fail to plan by taking into account projections of the future, we can be a poor state with little expansion or economic growth.

New Mexico is not about to dry up and blow away even without an increase in water supplies from new sources. But, as it or if it becomes a more "thirsty"

state, we have some major decisions to make as to how the available water should be used. These decisions will without doubt force changes in current political, institutional, and personal barriers to change. Domestic uses of course will have priority but what about watering lawns, washing cars, using water on hobby horse pastures, etc., where economic benefits are questionable? Every decision we make will affect our future. Historical or traditional uses may not be considered as basis for a future use.

People will, I believe, continue to move water if it is needed to where they want it and will produce the products needed and wanted, whatever these products be. Production areas have changed in the past and will change in the future. I disagree with the theories claiming that areas with surplus water have an unquestioned right to hold that water for some "potential" use in the indefinite future. We must determine national priorities that may well disregard existing political boundaries. Projections of the next hundred years are imperfect - and some will say impractical - yet, if we are to readjust to changes that are inevitable as well as to adjust those things that can be adjusted, long range projections and plans must be made. This is a continuous responsibility. Such imagineering projections force us to take stock of our resources, our policies, laws institutions, etc., and to modify them so as to provide a means to a better life for all people rather than taking whatever the consequences might hand out as a result of our short-sightedness in planning. Long range planning helps focus on the needs for and kinds of shorter range planning. By focusing down from long range to short range problems and development of alternative solutions, we do have opportunity to guide that change - at least in part - and in directions beneficial to all of society.

We prefaced this "emagineering" session with remarks about the futility of attempting projections as to the state of the world in 2068 by comparing the question today to a similar request of a man back in 1860 to describe 1968 conditions. Obviously conditions at both times are similar in that we just are not capable of seeing that far ahead. Yet, I propose to you today that unless we work diligently in the coming years, there may in fact be another disturbing similarity between 1868 and 2068. Namely, that in 1868 water was critical for survival, especially to the traveler of the desert Southwest and it may be equally as critical for survival in 2068 if we do not take the necessary action to assure an adequate water supply to meet the needs of that time, whatever they be.

I would summarize the job ahead in five points. We must (1) observe the facts and define the problem, (2) analyze these facts and all alternatives, (3) make decisions, (4) take the necessary action to implement the decision, and (5) accept the economic and social responsibilities for those actions.

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