

WATER RESOURCES PLANNING IN THE STATE OF CHIHUAHUA

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Before I read my simple writing about the planning and uses of water resources in the State of Chihuahua, on behalf of the Secretary of Hydraulic Resources, Mr. Jose Hernandez Teran, I want to thank the New Mexico State University and coordinator of this Thirteenth Annual New Mexico Water Conference for inviting me to be with you today.

There are, in the State of Chihuahua, vestiges of pre-hispanic works for the use of water, according to the discovery of a rudimentary system of canals in the Paquime ruins in Casas Grandes. Later, in colonial times, the water of the Conchos River was used to irrigate lands near San Francisco De Conchos. Moreover, during the same time were built several works to give water to communities, works that are still in use, like the aqueduct serving a part of Chihuahua City.

The use of water on a great scale began in 1916, when a privately owned construction company built the Boquilla Dam on the Conchos River near Camargo City, with the main purpose being electric power production, but the planned exploitation of water resources started in 1926 when the National Commission of Irrigation was created, to later be transformed into the Secretary of Hydraulic Resources.

At the beginning there were a lot of handicaps. There was no available data of any kind, the lack of Mexican technicians and, above all, the limited economic situation did not permit making reality of the big hydraulic works the country needed.

The experience obtained during forty-two years of irrigation activities, has taught us there must be two kinds of works, "big" and "small," according to the characteristics of the flows and the purposes of each project.

The best economic results are, generally, those of the so-called "big irrigation," because of the facilities in communication, credit, transportation, etc., facilities that most "small irrigation" works lack.

Considering that, the Secretary of Hydraulic Resources gave preference to "big irrigation" projects in the State of Chihuahua, building the following dams and their canal systems.

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Boquilla System, with a capacity of 2,430,000 acre-feet to irrigate 78,000 acres in Saucillo and Delicias valleys.

"Francisco I. Madero" Dam on San Pedro River, with a capacity of 345,000 acre-feet to irrigate 61,000 acres in Meoqui Valley.

"El Tintero" Dam on Santa Maria River, with a capacity of 105,000 acre-feet, to irrigate 10,400 acres in San Buenaventura Valley.

"Abraham Gonzalez" Dam on Papigochi River, with a capacity of 57,000 acre-feet, to irrigate 13,600 acres in Guerrero Valley.

"Las Lajas" Dam on Carmen River, with a capacity of 73,000 acre-feet, to irrigate 20,000 acres in El Carmen Valley.

Under construction is "Luis L. Leon" Dam on the Conchos River with a capacity of 690,000 acre-feet to irrigate 18,500 acres in the Ojinaga Valley and to avoid floods, which, in the past years, caused disastrous losses in lives, lands and cattle.

In project is San Diego Dam on Casas Grandes River, with a capacity of 200,000 acre-feet, to irrigate 20,000 acres in Casas Grandes Valley and San Gabriel Dam on Florido River, with a capacity of 120,000 acre-feet to irrigate 17,000 acres in Jimenez Valley.

With the last three dams and systems the "big irrigation" works are finished, because there is no other flow left that can be used in great scale.

There are other rivers, of course, like the Urique, Batopilas and Chinipas that cross the Sierras, but there is little land to irrigate and it would be antieconomic, for the moment, to build any work.

The "small irrigation" projects have always had one thing in common, to give small communities better ways of living at low cost.

The "small irrigation" national plan is aimed to build several works in order to use disseminated areas all over the state, works that will be of high social value, for they represent the indispensable to a lot of rural communities, in their necessities of water for human, livestock and agricultural uses. Those works will also serve to stop the flow of impoverished farmers to cities, a cause of many urban problems.

The following are the small works in service nowadays:

"Torreoncillos" Dam on Valsequillo River, irrigating 4,000 acres in Valle de Allende.

"La Ferreña" Dam on Valle de Allende River, irrigating 3,000 acres in Valle de Allende.

"Villa Lopez" Canals on Florido River, irrigating 4,600 acres in Villa Lopez.

"Esmeralda" Canals on Conchos River, irrigating 3,700 acres in Ojinaga Valley.

"Independencia" Dam on Nuevo Madero Creek, irrigating 2,300 acres in Madera Valley.

"Laguna Colorada" Dam on Casas Grandes River, irrigating 2,500 acres in Ascencion.

"Chinatu" Tank and Canal on La Quebrada Creek, for human, agricultural and hydroelectric uses.

Under construction are the following:

"Casa de Janos" Dam and Canals on Janos River, to irrigate 2,700 acres.

"Las Chepas" Dam and Canals on Bachiniva Creek, to irrigate 1,850 acres.

The projects are as follows:

"Calabacillas" Dam on Calabacillas Creek, to irrigate 1,200 acres.

"Agua Caliente" Dam on Gandara Creek, to irrigate 1,200 acres.

"El Pajarita" Dam on Pajarito Creek, to irrigate 1,200 acres.

"Bella Vista" Dam on Sauz Creek, to irrigate 2,700 acres.

"El Vallecillo" Dam on Vallecillo Creek, to irrigate 5,000 acres.

"La Junta" Dam on Basuchil River, to irrigate 5,000 acres.

"Bufalo" Dam on Parral River, to irrigate 4,300 acres.

In project are, also, a lot of wells, small dams, drinking troughs, and everything related with water to help hundreds of poor farmers all over the state, but especially those who live in the northeastern part, where rains are scarce and soils arid.

The use of subterranean waters is important, since they permit putting into production arid zones, or as a complement of big and small irrigation works. Many studies have been done in this matter, localizing the geohydrologic zones of the following valleys:

Juarez, Casas Grandes, Delicias, Villa Ahumada, Aldama, Camargo-Jimenez, Chihuahua, El Sauz, Palomas, San Buenaventura and Cuauhtemoc.

In those zones, with the exception of Juarez, are in production 1,246 wells, irrigating 114,130 acres.

In Juarez Valley, where 383 wells at variable depths give fair to bad quality water and hardly irrigate 20,000 acres, there was found a big artesian reservoir at 1,500 feet with a 130 feet deep dynamic level and, in many cases, with 16 foot-high jets of artesian water. In that zone drilling has been started on 80 wells 24 inches in diameter, to solve definitely the lack of water in the second and third units of the system.

An inventory of the reserves in the mentioned zones is now under study, to be able to plan the exploitation in an adequate way, avoiding a strong drop in the water levels. When a zone presents such a symptom, it can be of very bad consequences, a sort of prohibition is decreed, a prohibition that in no way means there must not be any new drilling, but to ration the uses of the existing and future wells, to use the strictly indispensable water.

In the field of water for domestic, industrial and recreational uses many works had been done, but, as everywhere else in the world, the necessities are always bigger than the water available.

The efforts of the federal, state and municipal governments, are coordinated to give water to 1,600,000 people. Almost half of them have no drinking water, getting it from brooks, springs, wells or car-tanks.

To solve that problem, the federal government through the Secretary of Hydraulic Resources, is doing the studies and projects, supervising the works and contributing with pipeline, pumps, and special parts. The state and municipal governments and even the people to be benefited by the works, contribute with labor and complementary funds. In that way, working united, we hope that by 1976 no town, big or small, urban or rural, will be without the most elemental of all services: drinking water.

According to the state's necessities and its economic and water dispossibilities, the Secretary's activities have been basically considered following a definite plan that had permitted a reduction of waste and duplicity of works and studies, and, above all, seeking to improve the people's way of living in its social and economic demands.

To accomplish that, one of the activities developed is integral planning for the correct use of water resources, to get, with the finished works, the maximum benefits in the shortest time possible, so the state can be in a good economic situation to go on with future works and projects, all of this with a tendency to increase the water reserves and irrigating areas.

In those plans is the widening of geohydrologic studies in producing zones and the exploration to find new subterranean reservoirs, to obtain the best results in the water-soil binomium. This is very important, because in irrigating the field, it is fundamental to increase the agricultural production in proper proportion to demographic growth and the economic development of both the state and country.