Development to Management:
The Changing Water Supply and Policy of Kansas

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Introduction

The State of Kansas has been viewed as a national leader in water policy and management for the last two decades. The Kansas water planning process has been a model for other states throughout the nation to use in the development of water policy and for the coordination of activities. This process has resulted in a number of changes to water management in Kansas including the Ogallala Aquifer, implementation of minimum desirable streamflows, and management of reservoir storage space through the Water Assurance Program.

Kansas has not always been viewed in this light, however. During the last part of the 19th century and the first 40 years of the 20th, Kansas often lagged behind other western states in policy planning and management of its water resources.

Water policy development in Kansas has been driven by either natural events or technological advances. For more than a century, water policy was established incrementally as environmental, economic, and technological factors revealed a limitation to the existing suite of laws.

Kansas chose to have a single ground- and surface-water quantity allocation system based on the prior appropriation doctrine. This choice has allowed consistent administration throughout the state even though conditions and resources vary greatly from one area of the state to the other. The allocation system, while consistent, has been far from stagnant. Significant changes have happened in nearly every decade since the 1940s that have put the state in a position to continually address water issues as they are identified.

The 1980s and 1990s saw the state move from a policy position of water development to one that enables management of the resource as well. As the demand for water grows and the resource becomes more limited, management will be the primary method by which future water and economic development can occur.

Kansas has invested millions of dollars to obtain storage space in large federal lakes. Likewise, the state has spent considerable amounts of money for other public water supply, recreation, and flood control practices. As those physical structures age, natural processes such as sedimentation and erosion lessen their value. Maintenance of current capital developments will be a major policy initiative in the future.

The state has also spent most of its economic development dollars on water in the eastern half of Kansas. But the economy of Western Kansas is vital, too. In order to stay competitive nationally, the state must establish methods to shift from our current water-based economy to one that is less water intensive. Actual implementation of new policy in this area will be a very important issue in the future.
Geographic and Geologic Setting

From a water resource perspective, Kansas has two distinct geographic settings. Rainfall across the State varies from 16 inches annually in the southwest corner to 42 inches in the southeast.

This drastic variation in rainfall leads to difference types of water availability for development. Likewise, water use varies greatly from west to east. Western Kansas is dominated by groundwater use for irrigated agriculture, with limited surface water. Eastern Kansas has a general abundance of surface water, used primarily for municipal and industrial purposes, but a limited supply of groundwater.

**Figure 1- Major Aquifers and Streams in Kansas**

This difference in water availability often makes statewide water policy difficult to develop and apply. Water policy to support irrigation and management in Western Kansas does not always correlate to good or appropriate policy for municipal / industrial dominated Eastern Kansas.

One key factor that must be considered in establishing water policy is the economy. While geography, topography, hydrology, and even culture vary between eastern and western Kansas, the common government, tax system, and sense of belonging lead to a desire for a productive economy throughout the whole state. We must work together for the economic success of the whole State.

Early Development and Policy

Early settlers established towns and homesteads where there was ready access to water. For larger settlements, that meant the major portion of the town must be near a stream so water would not have to be hauled over long distances. Development of water resources for economic growth did not happen for many years.

The earliest water developments were water-powered mills in central and eastern Kansas, and irrigation districts in the west. Water Policy for these water-power projects was passed in 1867, allowing for development of mill ponds for water power, and establishing rules by which mill dams could be built. Legislation for irrigation district design and operation was put in place in 1891.
These statutory policies were intended to protect the adjacent landowners from undue harm from these projects and set out basic operational rules. They were not intended to provide for economic development.

**Droughts and Floods**

Kansas, at its’ very heart, is a land of extremes. Nowhere was this more evident than in the 1930’s and 1950’s. Both decades saw devastating floods and lingering droughts.

The drought of the 1930’s and the associated Dust Bowl is well documented. What is less well known is the tremendous flood that happened in the middle of the drought in 1935. During a two-day period, a severe and widespread thunderstorm dumped tremendous amounts of water in the Republican River Basin in Colorado, Kansas and Nebraska. Essentially no flood control structures were in the basin at that time. The flood killed more than 100 people and did millions of dollars worth of damage.

The federal government was active in flood control and navigation during the late 1930’s and 1940’s. Flood control acts of both 1935 and 1944 set the course for the development of large-scale reservoir systems in the greater Missouri River Basin. The 1944 Act, commonly referred to as the Pick-Sloan Act, established an entire series of reservoirs both on the main-stem of the Missouri, as well as, every major tributary.

The drought-flood pattern was repeated somewhat in the 1950s. In July 1951, widespread rains raised of the Kansas, Marais des Cygnes, and Neosho rivers in eastern Kansas to levels where they were out of their banks. Again, millions of dollars and many lives were lost in the flood. This time, the flood was followed by a drought that lasted from 1952 to 1957. The economic damage of these two events lasted for years.

Droughts and floods of the 1930s and 1950s did more, than any argument or technical study, to convince state and federal lawmakers to take action. Both the Kansas legislature and the U.S. Congress set out to develop flood protection and water supply capability to alleviate these problems.

**Water Appropriation Act**

The 1945 legislature took what was probably the most important step in water quantity management in Kansas. A blue ribbon panel was convened to address the issues of increased water development, the need to encourage future economic growth, and a limited statutory framework with which to manage the water resources. The panel delivered their report to the governor and legislature proposing a significant and profound change to Kansas law in the way that water was viewed and managed.

To this day, The Kansas Water Appropriation Act provides the foundation upon which water-quantity policy and management is based. The Appropriation Act adopted the concept of first in time, first in right. This is the standard water administration tool that is used by the 17 western states today. The Act also established that water that lies under or passes through property is not actually owned by any one individual. The water is owned by the people and dedicated to the use of the people in the state, and subject to the control and regulation of the state.
At its basis, the Water Appropriation Act was, and is, a development law. With increased mechanization of farming, including ground-water irrigation, there was a need to protect an individual citizen's right to use water. Without legal protection, an individual could spend considerable capital to develop a water-use project only to see that project die because another individual used the water. The Appropriation Act assured the state would step in and protect the first person's right to use the water against future development. The Act gave structure to the rapid and widespread irrigation development in western Kansas that occurred in the 1960s and 1970s.

At the time of enactment, many limitations to this law prevented management of the resource by the state. First and foremost, no one was required to obtain permission from the state before a project could begin. However, the state would not protect the project from future development if a water right was not obtained.

The fact that the state's permission was not required put the chief engineer in an interesting position. During the 1960's and 1970's the chief engineer of the State Board of Agriculture's Division of Water Resources was receiving hundreds of applications for water rights each year. A denial of a water right did not mean that a proposed project could not, or would not, go forward. The state, through the chief engineer, made a conscious decision to permit each of these water right projects so that they would be documented and could be regulated more efficiently in the future. In retrospect, the chief engineer granted access to water rights to too many people in many areas of the west.

Over-appropriation is, in some measure, a subjective determination. How much ground-water level change is permissible and over what time frame are subjects of on-going and vigorous debate. There is no denying, however, that for many areas water has been taken out of the aquifer at a rate faster than it is replenished. This leads to an inevitable end. Without change in either policy or technology, the aquifer will ultimately be depleted of usable quantities of water at some point in the future.

**Federal Water Supply Act and State Water Planning Act**

The droughts and floods of the 1950s again caught the attention of both the state and federal governments. Each passed separate legislation in reaction to the feast and famine that had been experienced during the previous three decades.

The State of Kansas acted in 1956 and passed the State Water Planning Act. The Planning Act was designed make the state proactive in dealing with water supply and management issues. The Kansas Water Resources Board was established by the Act to plan for the development, conservation, and management of water resources in the state. At that time, development, conservation, and management meant implementing a plan for capital development projects that would protect the citizens from flooding and provide water supply during droughts.

Two years later Congress acted with passage of the 1958 Federal Water Supply Act. This law allowed states or local sponsors to participate in the development of large reservoirs. The only catch was the local sponsor had to repay the U.S. Army Corps of Engineers construction costs of the water supply storage component of the reservoir structure.
The fact that these two laws were passed so close together was fortunate. The Kansas Water Resources Board took advantage of the opportunity. The State gave assurances to repay the cost of storage in more than a dozen federal lakes. Consequently, the lakes were built larger, allowing for the use and storage of municipal and industrial water supplies into the future.

**Purchase of Storage Space in Federal Reservoirs and Water Marketing Act**

The Corps of Engineers proceeded with the design and construction of 15 reservoirs during the 1960s and 1970s. The Kansas Water Resources Board, while providing assurances that it would repay the cost of construction, had no authority to actually enter into contracts and buy the storage.

That changed in 1974 with passage of the State Water Plan Storage Act. The Storage Act allowed the Water Resources Board to contract both with the federal government to secure storage and with municipal and industrial customers to supply water. The Water Marketing Program established by the Storage Act was envisioned to be a raw water utility supplying water to municipal and industrial customers and recovering the state’s cost for providing for the storage.

*Figure 2 – Federal Water Supply Reservoirs*

The Water Marketing Program began in 1974 with the signing of the first water storage contract with the Corps of Engineers at Milford Lake. The first user contract was signed with Kansas Power and Light to serve the Jeffrey Energy Center in 1976. From inception, the Water Marketing Program was also an economic development engine. Key to the program was the state’s fronting both the initial capital and operational cost, thereby making water supply available at extremely low rates. Securing storage meant the State would have ample water supply for the next century of growth and development.

**Center Pivots**

While the state and federal government were busy developing municipal and industrial water supply storage in the eastern half of the state, the center pivot irrigation system was changing the face of agriculture in the west. First introduced in the late 1940s, this irrigation system boomed in the late 1960s and 1970s.
The center pivot was a huge step forward for the plains farmer. It allowed marginal dry cropland to be transformed into high production agriculture with a consistent water source. Literally millions of acres of land that previously had been pastureland or low production dry land were put into full-scale development.

Figure 3 - Water Right Development by Year

Soon an entire economy sprang up around irrigated agriculture in Kansas. The expansion of the cattle feeder and slaughter industry is probably the largest and most important related change. The center pivot allowed for increased production of alfalfa and corn in western Kansas, both major inputs into the cattle feeder industry. The amount and proximity of large quantities of feed led to development of large feedlots and packing plants. Today this industry has grown to a multi-billion dollar contribution to the Kansas economy.

Groundwater Management District Act

The growth of the center pivot irrigation industry, while a boon for the economy, has led to ground water declines over much of the Ogallala-High Plains Aquifer in Kansas. This in turn led to passage of the Groundwater Management District Act in 1972. The GMD Act put in place additional administrative tools to manage ground water in areas of intensive development or special concern.

A key factor in the Act was recognizing the importance of local input in managing the resource. The Act allowed the formation of groundwater management districts to provide proper management and conservation of water and to prevent economic deterioration of the area. Five districts were formed which cover the major aquifers of central and western Kansas.
1978 Changes to Water Appropriation Act

While the Groundwater Management District Act established the need for management of ground water, it did not significantly change the way that ground water rights were regulated. In 1978, the legislature took action to change the Water Appropriation Act. Philosophically, the largest change was requiring every person intending to develop a water project to first get permission from the Chief Engineer.

From a ground water perspective, this was the true beginning of the change from development to management. In the following decade, the Chief Engineer, with the advice of the groundwater management districts, closed whole areas to further water appropriation and development. Additional requirements also allowed the Chief Engineer to collect information from the water users and limit their use.

Water Planning in the 1980’s and 1990’s

The transition from development to management began in the mid 1970s and took hold in the 1980s and 1990s. Initiation of the Clean Water Act and the Safe Drinking Water Act as well as the Endangered Species Act at the federal level brought new players and rules to the game. The state responded with inclusion of environment with the Department of Health. Soon, the governor and legislature were seeing multiple state agencies speaking on water policy issues.

A governor’s convened a task force that made recommendations regarding coordination of state agencies. As a compromise between the Governor and the legislature, the Kansas Water Resources Board was abolished and replaced with the Kansas Water Office. The main job of the Water Office was both to continue the planning effort and to coordinate water resources among the various state agencies.

Under a revised water planning effort, a number of new management-oriented initiatives were developed. Issues such as minimum desirable streamflow, coordinated management of...
reservoir systems, and purchase of water rights in over developed areas were addressed. This put the state in a new position of being on equal footing with individual water right holders for management of the resource at a local level.

The water planning process also adopted a watershed, or basin approach, that allows the state and local partners to work in a cooperative manner to achieve true resource management.

At this point, the results of watershed planning and management have been mixed. Some areas have seen the state participate in addressing real on-the-ground problems that help the local economy and environment. Many other areas have seen problems continue and remain unresolved. Increased effort will be needed in the future to address the problems that exist.

**Ensuring Water for the Future Economy**

The era of development has not completely passed. There are many examples where further ground and surface water development, as well as water storage, may and will happen. The state will participate in some of this development by constructing multipurpose, small lakes.

As a state, we must find new and creative ways to protect and further develop our economy for the future. Ironically, the state is now in a position of maintaining our assets in the east and developing them in the west. Programs for water storage in the eastern half of the state must be protected. If we can accomplish this, we will have water for future economic growth.

Water quality and endangered species will become larger issues. Proper management of our streams and reservoirs can, in many instances, prevent problems and save local taxpayers countless dollars in mitigation and treatment efforts.

In the west, the state must become involved in securing water for the future. The Kansas economy is dependent upon a healthy western economy. Other than regulation, the state has done little to ensure that a healthy western economy continues.

Technological advances and improvements to on-farm management will extend the viability of the current irrigation/cattle feeder industry. However, for the long term, this is not the complete answer. Even with limited irrigation, many ground water levels will continue to decline.

The state must invest in new ways to ensure a productive economy in western Kansas. Limited ground water pumping and its location will be key to that economy. Kansas can be in a position to lead the region in diversifying the high plains economy and establishing long-term growth if we think in terms of 100 or 200 years, rather than 10 or 20.

**Outlook**

The outlook for the state of Kansas is bright. Kansas has always valued water and has recognized the direct link it has to our economy. We have set up the majority of the policy and institutional framework needed to plan for and implement true water management. If the state continues this tradition the economy can and will continue to prosper and expand.