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The Uncertain Certainty

By Lee Pilgrim, Editor, Texas Water Resources
Completion of Canyon Dam up above New Braunfels was good news to Rudy and Mary Ann Seidel. It meant that their dream house near Lake Dunlap would become reality. They had owned the site several years and had a cabin on it. Twice, however, the cabin had been swept away by water rushing down from the hill country after heavy rains. But the Seidels were told that the new dam on the Guadalupe River would eliminate that threat.

They built their house beautiful. So did others, all confident that Canyon dam stood as a fortress, defending them against the once- feared natural enemy, high water.

Four-and-a-half years later, the Seidel manor and many more homes, fine and otherwise, collapsed under the attack of a raging flood. Just below Canyon Dam on May 11, 1972, a huge cloud dumped nearly 20 inches of rain in two hours. Fifteen people were killed, and property damage amounted to several million dollars.

A freak flood, it was called. Many of the homes which were destroyed were situated above any level that had been reached by floods during the past 100 years.

Costs Nation $2 Billion

The U.S. Army Corps of Engineers estimates that flood losses in the United States cost about $2 billion annually. Year after year, the unpredictable flow and force of a river victimizes home owners, industries, utility companies, and farmers located in a flood plain.

Flood plain is defined as the relatively flat area or lowlands adjoining the channel of a river, creek or watercourse, ocean, lake or other body of standing water, which has been or may be covered by flood water. That definition also describes the location of some of the most beautiful residential developments in Texas.

Two billion dollars is a high price to pay for development in a flood plain, especially when a major portion of it is borne by the taxpayer. *Why, then, do people continue to build in a flood plain?* According to Dr. John McNeely, Texas A&M professor who recently completed a study on flood plain management, "People do not evaluate hazards appropriately. You might not carry fire insurance on your house if you weren't required to do so."

McNeely and his colleague in the Texas flood plains study, Dr. Ronald Lacewell, offer several more answers to the question:

- Ignorance of where, or what, the flood plain is. People do not see themselves as being in a flood plain.
- The government's acceptance of responsibility when disaster occurs. Traditionally the Federal government has bailed out victims through low-interest loans and forgiveness grants.
- Blind confidence in flood protection structures such as dams and concreted channels. It is virtually impossible to build enough dams and reservoirs to stop events like the New Braunfels disaster.
- The attitude that the aesthetic pleasure derived justifies the risk. Hurricanes are a certainty; yet people insist on building along the seashore.

Next Question

What can be done and what is being done to reduce the flood hazard problem? The cause has been identified: development in the flood plains. To eliminate that cause requires switching the emphasis from continued construction of engineering works, which do not really provide 100% flood protection, to management of the flood plain.

Enactment of the Flood Disaster Protection act of 1973 was a positive step in the direction toward flood plain management. It is an expanded flood insurance program intended as an eventual replacement for Federal disaster relief for flood occurrences. Its purpose is to make property owners more aware of flood hazards and have them contribute to their own protection. The bill requires the purchase of flood insurance in all identified flood hazard areas if any form of Federal financial assistance will be used for acquisition or construction purposes.

Heretofore many homes were built in the flood plain with no thought of flooding hazards. A beautiful setting was the primary consideration in choosing home-sites. Under the new National Flood Insurance Program realtors selling to anyone who will need financing are required to inform the buyer of the flood plain location--in face, to state the exact cost of flood plain insurance for the specific site. The amount is a clue to the degree of risk: high cost, high risk. Until this moment of truth, some home buyers haven't the faintest idea they are in a flood-potential area. many ask to have flood plain defined.

A system has been devised for determining risk zones to be used in figuring actuarial costs. The Texas Water Development Board has the task of assisting local governments

in setting up flood insurance participation programs. In return for making low-cost insurance available for flood property, the legislation requires participating communities to adopt and enforce land use and other control measures that will help reduce damage in flood-prone areas. About 600 Texas communities have been designated flood-prone areas.

Responsibility Shifted

Formerly the relief policy treated disasters as a public responsibility; every taxpayer in the United States bore a fraction of the damage costs. The flood insurance program shifts the responsibility to property owners. It combines 1) subsidized flood insurance for existing development and 2) required insurance based on actuarial rates for future development of flood-prone areas.

For example, the annual premium in a specific flood hazard zone for a new home with annual expected flood damages of $3,300 would be $3,300; and for an expected annual damages, the subsidized premium could be less than $500.

Previously, efforts to prevent unwise use of flood-prone areas were not usually successful. Because of erratic timing of flood losses, most people did not estimate realistically the hazard of flooding. If there had been no damaging flood in 5 to 10 years, there was the tendency to think there would never be another one. There is an almost universal tendency to expect flood protection works to do more than they are intended to do. Therefore people will build in the flood hazard areas unless land use controls keep them out.

Most communities in Texas will have future floods exceeding anything in the past because runoff accelerates as building and paving are increased. Long rainy periods will saturate the ground. Hurricanes will overload the water courses. But the time of such catastrophe is not known, and it is human nature to ignore the unknown. The flood insurance program does for people what they don't really want to do for themselves.

In the new program, cities may coordinate flood insurance regulations with other management devices which constitute land use planning. The insurance plan will create a consciousness that will reduce the amount of future flood plain development because high insurance costs will discourage building. Home builders will be forced to seek a higher location.

The flood plain, A&M studies emphasize, should be used for non- residential purposes. Options would be uses that are not subject to flood damage or that suffer only minimal damage. Ideal uses of the floodways are golf courses, parks, bicycle paths, horseback trails, and other recreational facilities. Other appropriate uses are transportation and industrial uses.

"Optimum decisions," McNeely says, "will probably require that joint thinking of the total population of the area involved. Once the decision has been made that land will not

be used for residence, other options may require coordinated planning. In San Antonio this resulted in the River Walk."

Conflict

The new policy is certain to cause conflict. Real estate values already have been affected. For example, land in Ford Bend County which sold for $5,000 to $10,000 and acre in recent years has been revalued at about $1,500 an acre. Public information available on actual flood risk in this area has brought this about.

People are not psychologically prepared to plan against the unknown such as possible flooding, and they will be reluctant to see top residential property going to other purposes "just because there might be a flood."

Lacewell said people are inclined to link fire and flood in the same context, but "that's not right because in case of fire, you have a large probability of not having a fire occur in a specific residence. But the probability of your flooding is 1. If you build in a flood plain, it's going to flood. It's just a matter of when."

All flood plains are different. Nacogdoches, victim of a damaging flash flood last year, is in a relatively steep valley. Other Texas flood plain areas are very flat, making it more difficult to adjust to alternative uses, he said.

Beneficial Use Plans

Flood plain management would enforce plans to ensure the most beneficial use of flood plain lands while safeguarding the safety, health, and welfare of the total community. It requires delineation of flood-prone areas in a uniform manner. This is done with official maps which measure the extent of periodic flooding. These are difficult to prepare because flooding differs even for rains of equal amounts.

It further requires building permits from a designated official for new construction or substantial improvements. This is to insure that the proposed construction is reasonably safe from flooding. If the proposed location has a flood hazard, the construction must be properly anchored and must use materials resistant to flood damage.

In addition, water supplies and sanitary sewage systems must be designed to minimize 1) infiltration of flood waters into these systems and 2) discharges from the systems into the flood waters. Similarly, liquid and solid waste disposal systems must be located to avoid impairment or contamination during flooding.

Too Late

Lacewell lamented the absence of flood control planning in cities where shopping centers and apartment developments with extensive paved areas increase the flow of water into already flood-prone creeks. He thinks the city should look at the high ground project and

carefully manage and plan such developments when they would affect the creek below. Concreting creeks, he added, does not solve the problem; it creates another one. Areas downstream from the concreted channels catch the rapid runoff. It is simply a shift of flooded region. The liability remains. He cautioned against changing the natural waterways and natural flow frequency.

Concreted waterways and other flood protection structures are intended to protect property and lives of flood plain dwellers. Those residents suffer damages when the rainfall is more than the drainage system can handle. And its back to the same theme: Few benefit; many pay. Protests from "highlanders," prudent in homesite selection, grow louder as they contribute to the safety and beauty enjoyed by the dwellers in riverine Edens.

Constructive Policy Change

McNeely and Lacewell view the flood insurance legislation as a constructive change in policy. "The former policy required individuals buying a home to make perhaps the largest investment in their lifetimes without adequate knowledge of the greatest risk to their property and even their safety. If flooding occurred, few had insurance, and their losses depended on public policy and charity. Now that the risks are established, the flood insurance is subsidized to create available and cheap protection for established houses; and flood insurance costs on new housing are in accordance with actuarial rates."

Homes along waterways have been carried off in the grips of rampaging waters for centuries. Now it appears that not destructive forces of nature, but constructive legislation and wise planning will cause the dwellings in the flood plains to disappear gradually. Flood control is a problem that planners have been wrestling with for years. Ten year ago the manager of San Antonio River Authority at the time, David H. Brune, told a "Soil, Water, and Suburbia" conference that flood control was one of the two most urgent responsibilities of SARA. Following is an excerpt from his paper:

. . . the great flood control problem of the future: how to keep pace with the City's growth. Across the nation the continued amassing of people in impacted urban areas, with consequent transformation of land from rural to urban uses, will create flood problems in downstream drainage areas beyond our present comprehension. The time will come when it will be beyond the financial capability of government at any level to construct all the flood control dams and/or channels needed to retard and/or carry off all the flood water generated by urban development.

Now is the time to begin exploring less costly methods of minimizing flooding so that the challenges of the future can be met at the least possible cost to taxpayers. Recognizing the need to go beyond expensive flood control projects, the Corps of Engineers has evolved a visionary program known as "Flood Plain Management." . . .the most logical method is to delineate the flood plains of our streams in areas not now developed and adapt those plains to uses that are compatible with occasional flooding.

. . . SARA hopes to prohibit, by ordinance, construction within the delineated flood plain. On a broader scale, use of flood plain management could not only provide flood protection at the cheapest possible cost, but could also provide the opportunity for open-space development in urban areas.